ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK PHASE I INVESTIGATIONS

TAM CERAMIC
NYS SITE NUMBER 932028
TOWN OF NIAGARA
NIAGARA COUNTY
NEW YORK STATE

Prepared For

DIVISION OF HAZARDOUS WASTE REMEDIATION
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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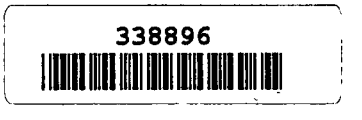
DATE OF SUBMITTAL: January, 1989



TAM CERAMICS

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SECTION I

EXECUTIVE SUMMARY

TAM CERAMICS

This report, prepared for the New York State Department of Environmental Conservation (NYSDEC) presents the results of the Phase I investigation for the TAM Ceramics Site (NYS Site Number 932028, no EPA Site Number given) located in the Town of Niagara, New York (see Figure I-1).

SITE BACKGROUND

The TAM Ceramic site (previously NL Industry site) is currently owned by TAM Ceramics. NL Industries and Titanium Alloy Manufacturing owned the site during the time wastes were disposed of on-site (1930-1976). Wastes disposed of on-site (more than 2500 tons) include uncalcined titanium oxide, aluminum oxide, silica fume, zirconium by-products and magnesium chloride (Interagency Task Force, 1979). Magnesium chloride is generally toxic, while the rest of the wastes are relatively nontoxic except as dusts posing an inhalation hazard (Sax, 1984). A site plan is presented in Figure I-2.

Groundwater monitoring at the TAM Ceramic site conducted by the Occidental Chemical Corporation in 1983 for the Hyde Park Landfill Plume Study indicated concentrations of the following constituents in excess of the New York State, Class GA, groundwater standards: phenol, monochlorobenzene, trichlorobenzene, hexachlorocyclopentadiene, trichlorophenol, tetrachlorobenzene, and hexachlorocyclohexane. These constituents, however, are not characteristic of the hazardous wastes known to be landfilled at the TAM Ceramic site. Based on the results of the Hyde Park Study, the groundwater contaminants listed above result from past disposal practices at the Hyde Park Landfill which is located to the north of the TAM Ceramic site.

Groundwater monitoring has not been conducted at the TAM Ceramic site to determine if hazardous wastes (aluminum oxide, magnesium chloride, iron, and titanium oxide) disposed at the site have degraded groundwater quality. HNu meter readings were taken during the site inspection conducted by ES and D&M and volatile organics were not detected on-site in concentrations exceeding background levels of 1 ppm.

ASSESSMENT

In an attempt to quantify the risk associated with this site, the Hazard Ranking System (HRS) currently being used by the New York State DEC to evaluate abandoned hazardous waste sites in New York state was applied. This system takes into account the types of wastes at the site, receptors and transport routes to apply a numerical ranking of the site. As stated in 40CFR Subpart H Section 300.81, the HRS was developed to be used in evaluating the relative potential of uncontrolled hazardous disposal substances to cause health or safety problems or ecological or environmental damage. It is assumed by the EPA that a uniform application of the ranking system in each state will permit EPA to identify those releases of hazardous substances that pose the greatest hazard to humans or the environment.

Under the HRS, three numerical scores are computed for each site to express the relative risk or danger from the site; taking into account the population at risk; the hazardous potential of the substances at a facility; the potential for contamination of drinking water supplies; for direct human contact, and for destruction of sensitive ecological systems and other appropriate factors. The three scores are:

- S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving groundwater, surface water or air. It is a

composite of separate scores for each of the three routes (S_{GW} = groundwater route score, S_{SW} = surface water route score, and S_A = air route score).

- S_{FE} reflects the potential for harm from substances that can explode or cause fires.

- S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

- The preliminary HRS score is:

S_M = 9.31	S_A = 0
S_{GW} = 15.66	S_{FE} = 0
S_{SW} = 3.80	S_{DC} = 0

RECOMMENDATIONS

The following recommendations are made for the completion of Phase II:

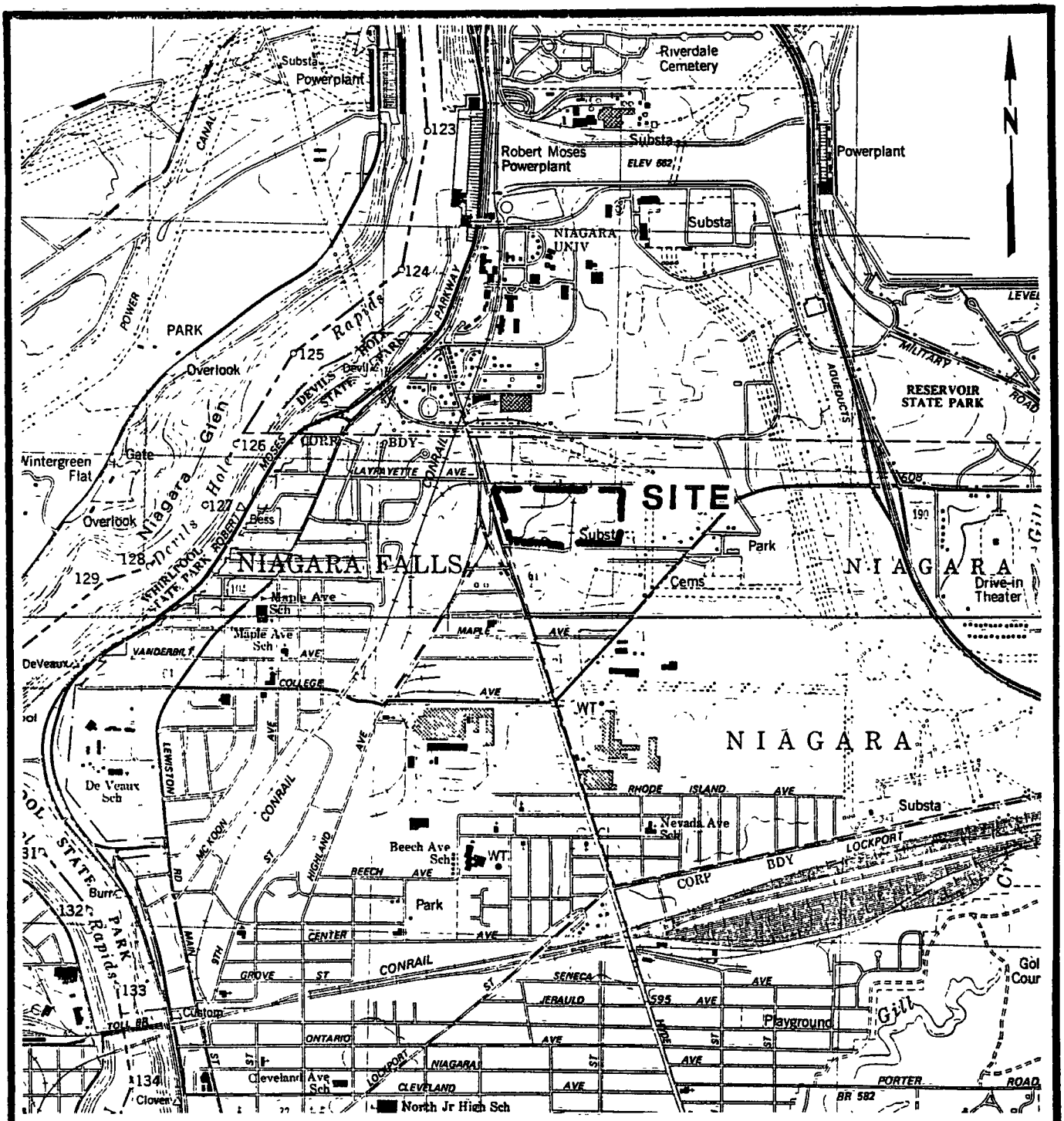
- Geophysical survey study consisting of a magnetometer survey.

- Groundwater monitoring system utilizing the existing upgradient and downgradient monitoring wells.

- Sediment monitoring consisting of one upgradient and one downgradient monitoring stations located in a drainage ditch north of the site.

- Analyses to include hazard substance list (HSL) metals.

The estimated man-hour requirements to complete Phase II are 1131, while the estimated cost is $76,826.



REFERENCE: U.S.G.S. 7.5' Topographic Map
Lewiston, NY-ONT (1980) and Niagara Falls,
NY-ONT (1980) Quadrangles

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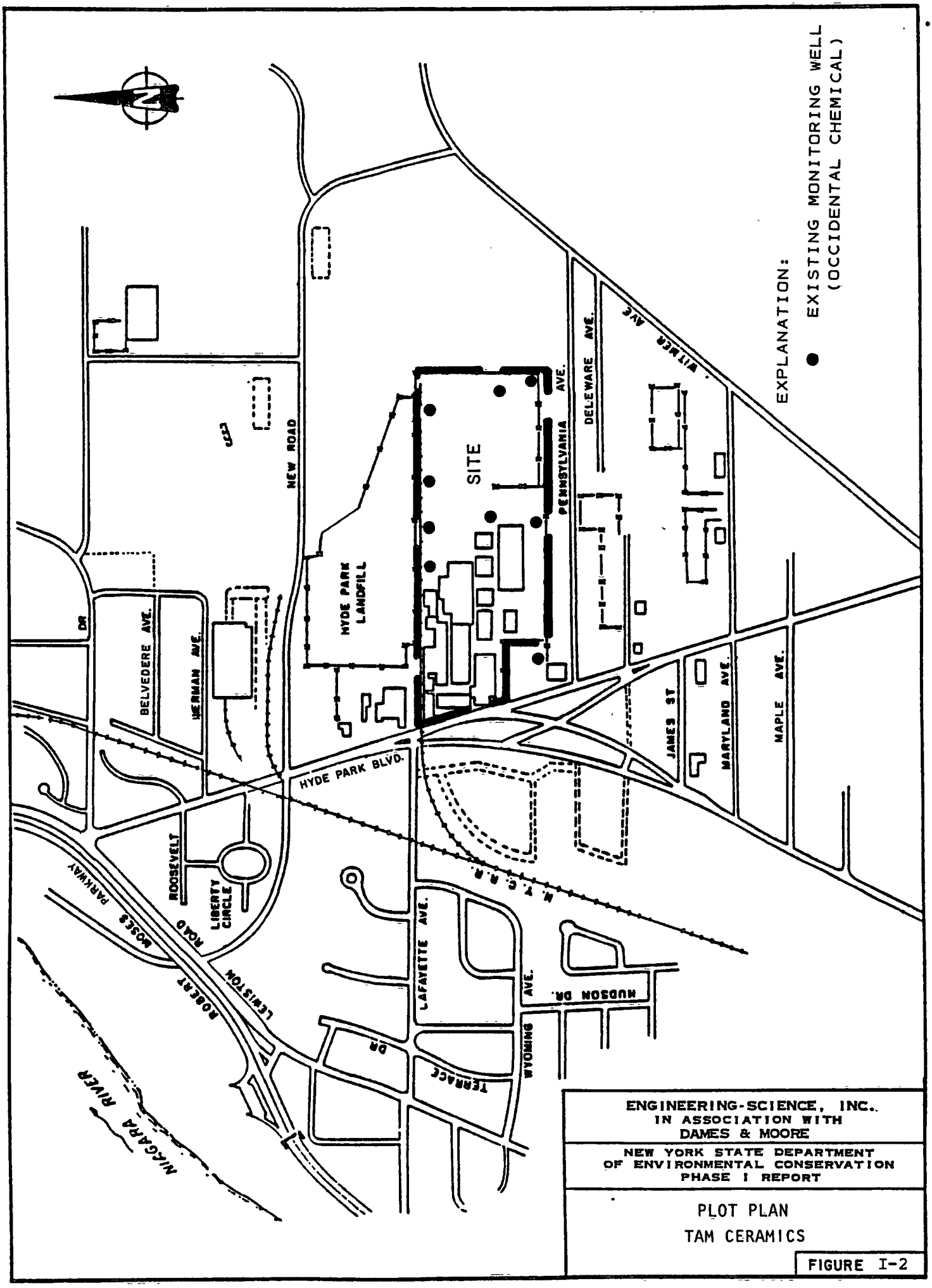
SITE LOCATION MAP
TAM CERAMICS

FIGURE I-1



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PLOT PLAN
TAM CERAMICS

FIGURE I-2

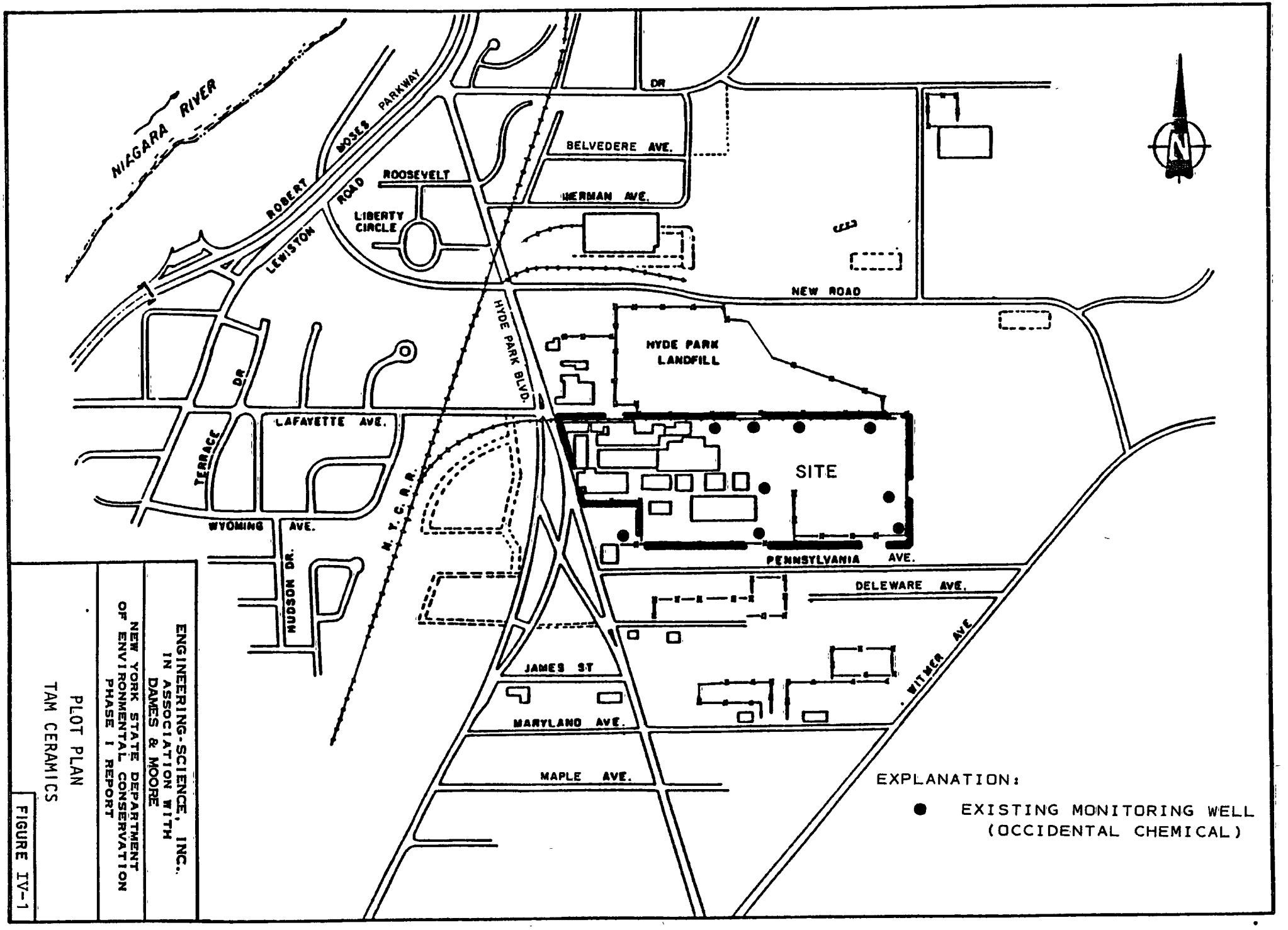
SECTION II
PURPOSE

The purpose of the Phase I investigation at the TAM Ceramics site was to assess the hazard to the environment caused by the present condition of the site. This assessment is based on the Hazard Ranking System, which involves the compilation and rating of numerous geological, toxicological, environmental, chemical, and demographic factors and the calculation of an HRS score. During the initial portion of the investigation, available data and records, combined with information collected from a site inspection, were reviewed and evaluated. The investigation at this site focused on the disposal of uncalcined titanium oxide, zircon by-products, magnesium chloride, and silica wastes. Based on this initial evaluation of the TAM Ceramic site, a Phase II Work Plan has been prepared for collecting any additional data needed to complete the HRS score. In addition, a cost estimate for the recommended Phase II work is provided.

SECTION III
SCOPE OF WORK

The scope of work for the New York State Inactive Site Investigation Program (Phase I) was to collect and review all available information necessary for the documentation and preparation of a Hazard Ranking System score and a Phase II work plan and cost estimate if required. The work activities performed included data collection and review, a site inspection, and interviews with knowledgeable individuals of past and present disposal activities at the site.

The sources contacted during this Phase I investigation included government agencies (federal, state and local), present site owners and operators, and any other individuals that may have knowledge of the site, as identified during the performance of the investigation. These sources are listed in Appendix A. The intent of this list is to identify all persons, departments, and/or agencies contacted during the fourth round of the Phase I investigation even though useful information may not have been collected from each source contacted.



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PLOT PLAN
TAM CERAMICS

FIGURE IV-1

SECTION IV

SITE ASSESSMENT

SITE HISTORY

The TAM Ceramics site, a 30-acre facility, was owned by Titanium Alloy Manufacturing Co. prior to 1948, by NL (National Lead) Industries from 1948 to 1979, and by TAM Ceramics from 1979 to date. The zirconium and coke process was the primary production and waste generating operation at the facility. This process used titanium as a raw material to produce zirconium silicate. In 1974, the process was modified and wastes containing titanium were no longer generated. Disposal at the site occurred between 1930 to 1976 (Interagency Task Force Report, 1979).

The Tam Ceramic site is located in the Town of Niagara, south of Hookers' Hyde Park Landfill which is currently under investigation. This adjacent site has been extensively studied because of the disposal of hazardous waste on-site. Further, contamination from the site has migrated to the TAM Ceramics site via the groundwater pathway (Occidental Chemical Corp, 1983).

The area east of the production facilities was used for the disposal of generated wastes. These wastes were both landfilled below ground and stored on-site in waste piles (Interagency Task Force on Hazardous Wastes, 1979). Drummed wastes were also stored and disposed of in the same manner. One of the wastes, magnesium chloride is generally toxic, while the rest of the wastes are relatively nontoxic except as dusts posing an inhalation hazard (Sax, 1984). The types and quantities of wastes that were disposed of at the site are provided in Table IV-1.

TABLE IV-1
TYPES AND ESTIMATED QUANTITIES OF
HAZARDOUS WASTE DISPOSED OF AT THE
TAM CERAMIC SITE

Waste Types Treated or Disposed at This Site	Physical State	Total Quantity (rough estimate)	Type of Container Any
Uncalcined titanium oxide	Solid	385 tons	none
Ammonium zirconium carb. sol.	Liquid	3.6 tons	steel drum
Magnesium chloride with zirconium impurity	Solid	43 tons	steel drum
Zirconium-sodium-potassium chloride mixture (fused salt)	Solid	3.3 tons	steel drum
Aluminum oxide, with titanium impurity	Solid	2,000 tons	none
Iron-carbon-titanium alloy	Solid	500 tons	steel shell
Silica fume (with motor oil)	Solid/ sludge	50 tons	none
"Ivex" lotion (ammonium zirconium carbonate	Liquid	< 1 ton	plastic bottles

Source: Interagency Task Force on Hazardous Wastes - TAM Ceramics site, March, 1979

In 1981, some of the above ground drummed wastes and waste piles were removed from selected areas of the disposal site (Walsh, 1981). The removed wastes were transported to the Modern Landfill by Modern Disposal Incorporated for disposal. Presently, several small (approximately one foot high) waste piles (zirconium chlorinated scraps) remain on-site. The waste types and quantities removed from the site include:

- 500 tons of iron carbon titanium alloy complete with the broken arc furnace shells
- 740 cu.yds. est. 1,000 tons of inert slag and scrap
- 4 drums zirconium oxychloride
- 12 drums zircon fused salts
- 20 drums ammonium zirconia carbonate solution (3.6 tons).

SITE TOPOGRAPHY

TAM Ceramics is a 30-acre manufacturing facility located on Hyde Park Boulevard, Town of Niagara, Niagara County, New York. The disposal area is confined to the open field approximately 15 acres to the east of the plant buildings.

The TAM Ceramics facility is located in a commercial and residential section of Niagara, residential areas exist to the immediate east and west of the facility, with Hyde Park landfill to the north, and other commercial properties to the south.

The wastes are disposed in the open field located on the plant property. The most common method used was burial; however, some wastes were stored in waste piles above ground surface (Interagency Task Force, 1979). Currently, the topography exists as a grass covered flat field, gently sloping to the west, with small mounds as a result of disposal pit covering. Various process equipment parts are stored on the west side of this field (ES and D&M Site Visit, 12/86).

Access to the site is controlled by plant security personnel. The entire disposal area is within fenced plant property. The site is no longer used as a disposal area, past site remediation involved the removal of most above ground wastes; however, buried materials were not excavated, (Walsh, 1981).

A drainage ditch exists on the northern edge of the site bordering both the TAM Ceramic site and the Hyde Park Landfill. Surface water flows east to west in this ditch where it eventually drains into the plant sewer system. Minor surface water flows were noticed during a recent site visit, also flowing westerly and draining into the plant sewer lines (ES and D&M Site Visit, 12/86). The plant sewers tie into the City of Niagara Falls Sewer System. The Niagara River is approximately 0.4 miles west of the site (USGS Topographic Map, 1980).

The majority of the area in the vicinity of the plant site is on the municipal water supply system; however, five (5) residences on Pennsylvania Avenue are known to have private groundwater wells (Hopkins, 1985). Groundwater samples from these wells identified elevated levels of contaminants. The nearest of these wells is approximately 500 feet east of the outer boundary of the site (NCHD, 1985).

Local Sensitive Environment

There are no registered wetlands within 3 miles of this site (NYSDEC, 1986). There are no federally designated critical habitats in New York State (Ozard, 1986).

Regional Geology and Hydrology

The site is located in the Erie-Ontario lowlands physiographic province. The bedrock of this region is predominantly limestone, dolostone, and shale. Most of the rocks are deep aquifers with regional flow to the south; however, flow may vary locally (NYS Museum and Science Service Bedrock Geology Map).

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till throughout the region, and moraines (generally till) mark former ice margins. The melting of ice, ending approximately 12,000 years ago, produced large volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments.

As glacial ice retreated from the region, meltwater formed lakes in front of the ice margin. The Niagara County region is covered by lake sediments, the most recent being from Lake Iroquois (a larger predecessor to Lake Ontario). The sediments consist of blanket sands and beach ridges which are occasionally underlain by lacustrine silts and clays (indicating quiet, deeper water deposition).

Granular deposits in this region frequently act as shallow aquifers whereas lacustrine clays, as well as tills, often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials (Johnston, 1964).

SITE HYDROGEOLOGY

Bedrock beneath the site is Lockport Dolomite, occuring at depths of 10 to 20 feet below ground surface. The slope on the bedrock surface is west to northwest towards the Niagara River (Occidental Chemical Corporation, 1983).

The bedrock is reported to be overlain by a thin till lense which is in turn overlain by red, brown and gray clay layer approximately 4 to 8 feet thick. Overlying the clay is a gray silt which grades to fine sand and gravel. This unit is approximately 4 to 6 feet thick. A black topsoil overlies the previous unit to ground level (Occidental Chemical Corporation, 1983).

Due to the low permeability of the soils (assumed to be 10^{-5} cm/sec to 10^{-7} cm/sec) a soil aquifer is not expected to exist on site. However, a saturated zone may occassionally occur in the till due to the fractured nature of the bedrock. The aquifer of concern is expected to occur within the bedrock at depths of 20 feet or more (Occidental Chemical Corporation, 1983). Ground water flow is currently to the northwest towards Niagara River; however, if dewatering schemes are employed at the Hyde Park Landfill, this pattern could result in groundwater movement toward the north-northwest (Occidental Chemical Company, 1983).

SITE CONTAMINATION

From 1930 to 1976, an estimated 2,986 tons of wastes from the NL Industry plant were disposed of on-site (Interagency Task Force, 1979). One of the wastes, magnesium chloride is generally toxic, while the next of the wastes are relatively nontoxic except as dusts posing an inhalation hazard (Sax, 1984). Some of these wastes were removed for off-site disposal in 1981 (Walsh, 1981). To date, no groundwater, surface water, or waste sampling has been conducted at the site to determine the extent of contamination resulting from previous disposal practices at the TAM Ceramics site.

The Hyde Park Landfill located adjacent to the TAM Ceramics property was previously used for the disposal of hazardous wastes. An extensive groundwater study has been conducted of this site to determine the extent of plume migration. To measure the contaminant plume, monitoring wells were installed in the vicinity of the landfill which included the TAM Ceramics property (see Figure IV-1). Several contaminants were detected in concentrations that exceed the New York State Class GA groundwater standards. These contaminants include phenol, mono-, tri-, and tetrachlorobenzene, trichlorophenol, hexachlorocychlohexane and hexachlorocyclopentadiene (Occidental Chemical Company, 1983). However, these constituents are not characteristic of the hazardous wastes known to be landfilled at the TAM Ceramic site. Therefore, groundwater

contamination is not attributable to the disposal of wastes on the TAM Ceramics site. The analytical results of the Hyde Park Landfill study are provided in the Appendix.

HNu meter readings were taken upwind and downwind during the site inspection conducted by ES and D&M and volatile organics were not detected above background levels of 1 ppm.

PRELIMINARY APPLICATION OF HAZARD RANKING SYSTEM

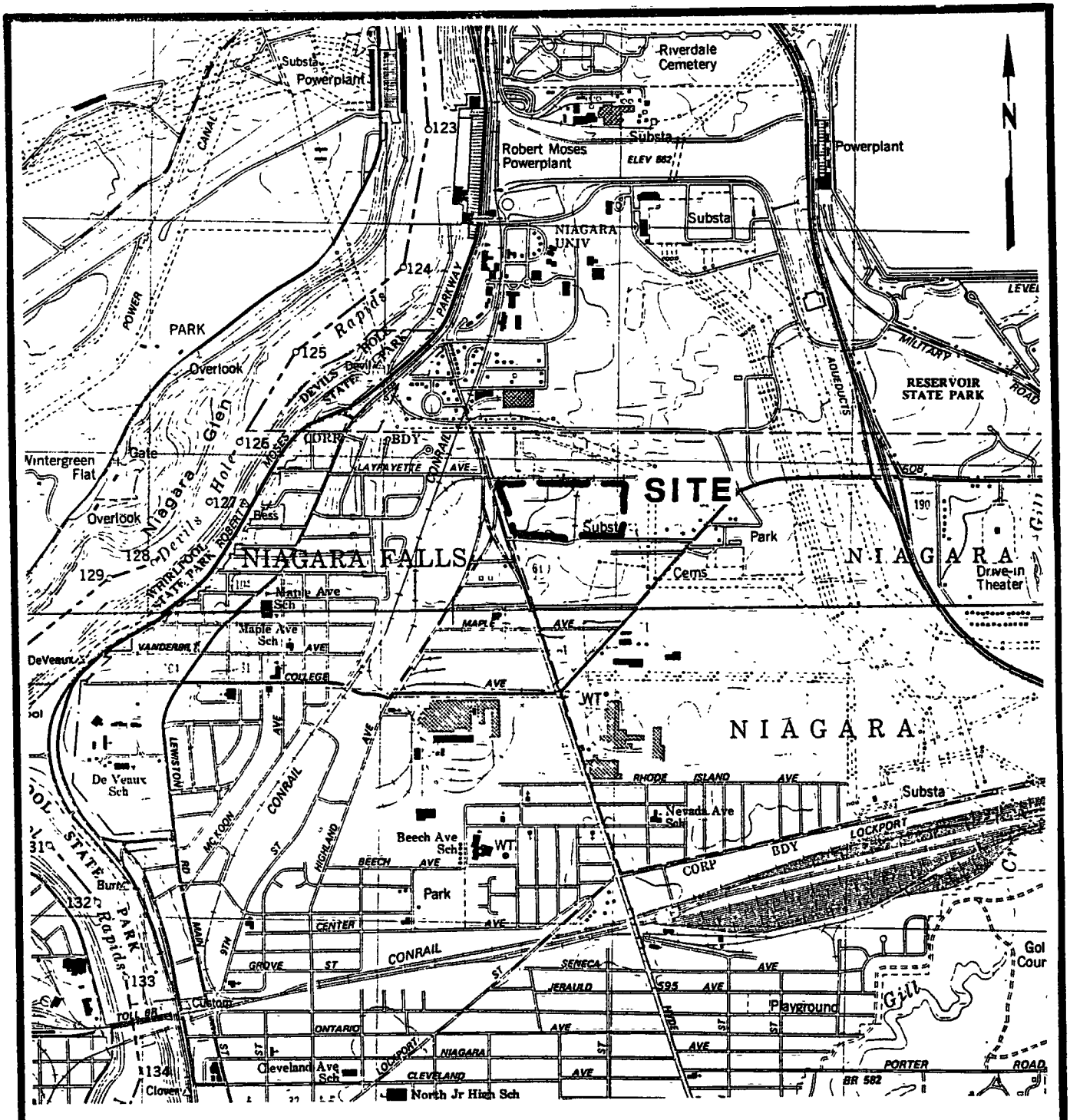
NARRATIVE SUMMARY

The 30-acre TAM Ceramic site is located south of the Hyde Park Landfill site along Hyde Park Boulevard in the Town of Niagara, New York. Between 1930 and 1976, approximately 2,986 tons of wastes including titanium oxides, magnesium chloride, silica fumes, ammonium zirconium carbide solution, and other zirconium products were disposed of at the eastern section of the TAM Ceramics site (Interagency Task Force, 1979). One of the wastes, magnesium chloride is generally toxic, while the rest of the wastes are relatively nontoxic except as dusts posing an inhalation hazard (Sax, 1984). Recently, drums of zirconium oxychloride, zircon salts, and other zircon by-products were removed and disposed of in the Modern Landfill located in Model City, New York (Walsh, 1981).

A recent groundwater study of the Hyde Park Landfill detected several contaminants on the TAM Ceramic site which exceeded the New York State, Class GA, groundwater standards. These contaminants include phenol, mono-, tri-, and tetrachlorobenzene, trichlorophenol, hexachlorocyclopentadiene, and hexachlorocyclohexane (Occidental Chemical Company, 1983). These constituents are not characteristic of the waste disposed of at the TAM Ceramic site. Therefore, these contaminants are not attributed to previous disposal operations at the TAM Ceramic site.

HNu meter readings were taken upwind and downwind during the site inspection conducted by ES and D&M and did not detect volatile organics above background levels of 1 ppm.

Currently, piles of zirconium chlorinated scraps are visible on-site (ES and D&M Site Inspection, 1985). There are 5 private drinking water wells in use on Pennsylvania Avenue, located southeast and less than 1 mile of the TAM Ceramic site (Hopkins, 1985).



LATITUDE: 43°07'42" N
LONGITUDE: 79°02'13" W

SCALE
0 1000 2000 3000 4000 FEET

REFERENCE: U.S.G.S. 7.5' Topographic Map
Lewiston, NY-ONT (1980) and Niagara Falls,
NY-ONT (1980) Quadrangles

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SITE LOCATION MAP
TAM CERAMICS

FIGURE V-1

Facility Name: TAM Ceramics Date: 1/7/86

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	15.66	245.24
Surface Water Route Score (S_{sw})	3.80	14.44
Air Route Score (S_a)	0.00	0.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$		259.68
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		16.11
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		9.31

WORK SHEET FOR COMPUTING S_M

Facility Name: TAN CERAMICS Date: 1/7/86

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100			S_{FE} = 0		

FIRE AND EXPLOSION WORK SHEET

Facility Name: TAM CERAMICS Date: 1/7/96

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	(0) 1 2 3	1	0	3	8.2
3 Containment	0 (15)	1	15		8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	3	15	8.4
5 Targets					8.5
Population Within 1-Mile Radius	0 1 2 3 (4) 5	4	16	20	
Distance to a Critical Habitat	(0) 1 2 3	4		12	
Total Targets Score			16	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			0	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 0		

DIRECT CONTACT WORK SHEET

HRS COVER SHEET

Facility Name: TAM Ceramics

Location: Town of Niagara, Niagara County, New York

EPA Region: II

Person(s) in charge of the facility: Dennis Smith
James Walsh - Engineering Manager

Name of Reviewer: Cathy J. Bosma Date: 01-07-86

General Description of the facility:

The Tam Ceramic site, a 30-acre facility, consists of landfilled and above ground storage of zirconium chlorinated scraps, titanium oxide, magnesium oxide, and aluminum oxide laden wastes. In 1981, all above ground drums, and most waste piles, except for a few piles of zirconium chlorinated scrap, were excavated from the TAM Ceramic site and disposed of in the Modern Landfill in Model City, NY (Walsh, 1981). Disposal at the TAM Ceramic site occurred between 1930 and 1976. Five drinking water wells are located within 1/4 mile of the landfill site. Monitoring wells were installed on-site by TAM Ceramics and by Occidental. Monitoring wells installed by Occidental are to monitor downgradient concentrations from Hyde Park Landfill.

Scores: S_M = 9.31 (S_{GW} = 15.66 S_{SW} = 3.80 S_A = 0)

S_{FE} = 0

S_{DC} = 0

nNYSDEC 1:22

Facility Name: TAM Ceramics Date: 1/7/86

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6	
Net Precipitation	0 1 (2) 3	1	2	3	
Permeability of the Unsaturated Zone	0 (1) 2 3	1	1	3	
Physical State	0 1 (2) 3	1	2	3	
Total Route Characteristics Score			11	15	
3 Containment	0 1 2 (3)	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
Hazardous Waste Quantity	0 1 (2) 3 4 5 6 7 8	1	2	8	
Total Waste Characteristics Score			17	26	
5 Targets					3.5
Ground Water Use	0 1 (2) 3	3	6	9	
Distance to Nearest Well/Population Served	0 4 6 8 (10) 12 16 18 20 24 30 32 35 40	1	10	40	
Total Targets Score			16	49	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			8,976	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 15.66		

GROUND WATER ROUTE WORK SHEET

Facility Name: TAM Ceramics Date: 1/7/86

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 (2) 3	2	4	6	
Physical State	0 1 (2) 3	1	2	3	
Total Route Characteristics Score			8	15	
3 Containment	0 1 2 (3)	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 (15) 18	1	15	18	
Hazardous Waste Quantity	0 1 (2) 3 4 5 6 7 8	1	2	8	
Total Waste Characteristics Score			17	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/ Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			2,448	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 3.80		

SURFACE WATER ROUTE WORK SHEET

Facility Name: TAM CERAMICS Date: 11/7/86

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	0 45	1	(0)	45	5.1
Date and Location: -					
Sampling Protocol:					
If line [1] is 0, the S_a = 0. Enter on line [5] . If line [1] is 45, then proceed to line [2] .					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100			S_a = 0		

AIR ROUTE WORK SHEET

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

FACILITY NAME: TAM Ceramics (NL Industries)

LOCATION: 4511 Hyde Park Blvd., Town of Niagara, Niagara County, New York

GROUND WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum):

Due to the proximity of the Hyde Park Landfill and its contamination plume, accurate assessment of releases from the TAM Ceramics site cannot be made.

Rationale for attributing the contaminants to the facility:

No observed releases can be attributed to the site as monitoring conducted at the site was part of the Hyde Park Landfill Study, not an evaluation of past disposal practices at the TAM Ceramics site.

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) in concern:

Bedrock aquifer
(Occidental Chemical Corporation, Pump Installation Report, 1983)

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Less than 20 feet
(Hyde Park Study, Boring Logs, 1983)

Depth from the ground surface to the lowest point of waste disposal/ storage:

10 feet at lowest point of waste disposal
(ES and D&M Site Visit, 1985)

Net Precipitation (CFR, Part 300, App. A.)

Mean annual or seasonal precipitation (list months for seasonal):

Mean annual precipitation is 36"
(US Department of Commerce, National Climatic Center, Climatic Atlas of the United, States, 1979)

Mean annual lake or seasonal evaporation (list months for seasonal):

Mean annual lake evaporation is 27"
(US Department of Commerce, National Climatic Center, Climatic Atlas of the United, States, 1979)

Net precipitation (subtract the above figures):

36" - 27" = 9" net precipitation
(US Department of Commerce, National Climatic Center, Climatic Atlas of the United, States, 1979)

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Silty clays with some sand
(Occidental Chemical Company, Boring Logs, 1983)

Permeability associated with soil type

10^{-5} cm/sec to 10^{-7} cm/sec
(Freeze, R.A. and J. A. Cherry, Groundwater, 1979)

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Powders, fine material - HRS = 2.
(Interagency Task Force, 1979)

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:
Waste piles uncovered and no liner. Landfill unlined and no run-on control.
(Interagency Task Force, 1979; ES and D&M Site Visit, 1985).

Method with highest score:
Unlined landfill and no run-on control.
(ES and D&M Site Visit, 1985; Interagency Task Force, 1979)

* * *

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:
Uncalcined titanium oxide, ammonium zirconium carbonate sol., magnesium chloride, zirconium-sodium-potassium chloride mixture, aluminum oxide, iron-carbon-titanium alloy, silica fume.
(Interagency Task Force, 1979)

Compound with highest score:
Magnesium chloride - HRS = 15

Note: Priority pollutant organics detected in groundwater were not scored since these contaminants are attributable to contaminant migration from the Hyde Park Landfill, north of the TAM Ceramic site.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

An estimated 2,986 tons of industrial wastes from TAM Ceramics was disposed of at the on-site disposal area (Interagency Task Force, 1979). Approximately 18% of these wastes were reportedly removed from the site (Walsh, 1981). As far as is known, 43 tons of magnesium chloride waste remain on site. The balance of the wastes are relatively nontoxic and do not present a hazard to the groundwater, although they may present an inhalation hazard as dusts (Sax, 1984).

Basis of estimating and/or computing waste quantity:

For HRS scoring, the quantity of hazardous waste on site with the potential to impact the groundwater route is assumed to be 43 tons based on two reports (Interagency Task Force, 1979; Walsh, 1981).

5. TARGETS

Ground Water Use

Uses(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Residential wells are used as a source of drinking water; municipal water from an alternative unthreatened source is presently available (Hopkins, M., NCHD, 1985).

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Residences on Pennslyvania Avenue
(Hopkins, M., NCHD, 1985)

Distance to above well or building:

Approximately 500 feet
(ES Site Visit, 1985)

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

5 residences on Pennsyvania Avenue, approximately 19 people total.
(Hopkins, M., NCHD, 1985)

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Land not known to be irrigated with water withdrawn from the aquifer of concern within 3 miles of the property.
(ES and D&M Site Visit, 1985)

Total population served by ground water within a 3-mile radius:

19 people (5 residences X 3.8 people per house = 19 people)
(Hopkins, M., NCHD, 1985)

SURFACE WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

No surface water monitoring has been conducted at the TAM Ceramics site to determine if past disposal practices have resulted in the migration of hazardous constituents via the surface water route
(NYSDEC Registry Sheet, 1983; EPA/USGS, 1985)

Rationale for attributing the contaminants to the facility:

No surface water monitoring conducted, no observed release is attributable to the surface water route
(NYSDEC Registry Sheet, 1983; EPA/USGS, 1985)

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

2% slope to the west north west
(USGS Topographic Map, Lewiston Quadrangle, 1980; ES and D&M Site Visit, 1985)

Name/description of nearest downslope surface water:

A drainage ditch borders the north edge of the site
(USGS Topographic Map, Lewiston Quadrangle, 1980; ES and D&M Site Visit, 1985)

Average slope of terrain between facility and above-cited surface water body in percent:

2% west north west
(USGS Topographic Map, Lewiston Quadrangle, 1980; ES and D&M Site Visit, 1985)

Is the facility located either totally or partially in surface water?

No.
(ES and D&M Site Visit, 1985)

Is the facility completely surrounded by areas of higher elevation?

No.
(ES and D&M Site Visit, 1985)

1-Year 24-Hour Rainfall in Inches

2.1"
(US Department of Commerce, National Climatic Center, Climatic Atlas of the United States, 1979)

Distance to Nearest Downslope Surface Water

Niagara River is approximately 0.4 miles west of site
(ES and D&M Site Visit, 1985; USGS Topographic Map: Lewiston Quadrangle, 1980)

Note: A drainage ditch is located on-site which conveys surface water to a storm sewer system and the Niagara River, respectively. However, the ditch is not scored because it is man made.

Physical State of Waste

Powders, fine materials - HRS = 2
(Interagency Task Force, 1979)

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Waste piles uncovered and no diversion system present. Landfill not adequately covered and no diversion system present
(Interagency Task Force, 1979; ES/D&M Site Visit, 1985)

Method with highest score:

Landfill not adequately covered, no diversion system present
(Interagency Task Force, 1979; ES/D&M Site Visit, 1985)

Note: Most of the waste piles were removed from the disposal site in 1981 (Walsh, 1981).

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Uncalcined titanium oxide, ammonium zirconium carbonate sol., magnesium chloride, zirconium-sodium-potassium chloride mixture, aluminum oxide, iron-carbon-titanium alloy, silica fume. (Interagency Task Force, 1979)

Compound with highest score:
Magnesium chloride - HRS = 15
(SAX, 1984)

Note: Priority pollutant organics detected in groundwater were not scored since these contaminants are attributable to contaminant migration from the Hyde Park Landfill, north of the TAM Ceramics site.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

An estimated 2,986 tons of industrial wastes from TAM Ceramics was disposed of at the on-site disposal area (Interagency Task Force, 1979). Approximately 18% of these wastes were reportedly removed from the site (Walsh, 1981). As far as is known, 43 tons of magnesium chloride waste remain on site. The balance of the wastes are relatively non-toxic and do not present a hazard to the groundwater, although they may present an inhalation hazard as dusts (Sax, 1984).

Basis of estimating and/or computing waste quantity:

For HRS scoring, the quantity of hazardous waste on site with the potential to impact the groundwater route is assumed to be 43 tons based on two reports (Interagency Task Force, 1979; Walsh, 1981).

* * *

5. TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Commercial and industrial use, limited recreational use.
(ES and D&M Site Visit, 1985; NYS Atlas of Community Water System Sources, 1982)

Is there tidal influence?

No.
(USGS Topographic Map, Lewiston Quadrangle)

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Site is not a coastal area.
(USGS Topographic Map: Lewiston Quadrangle, 1980)

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile
(NYSDEC Wetlands Maps)

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

There are no federally designated critical habitats within New York State.
(Ozard, 1986)

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

There are no surface water supply intakes within 3 miles of the site.
(NYS Atlas of Community Water System Sources, 1982)

Computation of land area by above-cited intake(s) and conversion to population (1.5 people per acre):

Not applicable.

Total population served:

None, surface water is not used as a source of potable water within 3 miles of the site
(NYS Atlas of Community Water System Sources, 1982)

Name/description of nearest of above water bodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles:

Not applicable.

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

HNu meter readings were taken upwind and downwind at the site and volatile organics were not detected above background concentrations of 1 ppm.
(ES/D&M Site Visit, 1985)

Date and location of detection of contaminants:

Not applicable, volatile organics were not detected on-site.
(ES and D&M Site Visit, 1985)

Methods used to detect the contaminants:

HNu meter.

Rationale for attributing the contaminants to the site:

Not applicable, no observed release.

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

No reactive compounds are known to exist on-site.
(NYSDEC, Registry Sheet, 1983)

Most incompatible pair of compounds:

No incompatible pair of compounds are known to exist on-site.
(NYSDEC, Registry Sheet, 1983)

Toxicity

Most toxic compound:

No toxic compounds with the potential to impact the air pathway are known to exist on-site. Priority pollutant organics detected in the groundwater is not a hazard for the air pathway.
(NYSDEC, Registry Sheet, 1983)

Hazardous Waste Quantity

Total quantity of hazardous waste:

Hazardous wastes were disposed of on-site; however, the wastes (iron and magnesium containing materials) do not pose a threat via the air pathway.

Basis of estimating and/or computing waste quantity:

For HRS scoring, no hazardous waste exists on-site which pose a threat via the air pathway.
(Interagency Task Force, 1979)

* * *

3. TARGETS

Population Within 4-Mile Radius

Underline radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

8,972 people, population estimate based on house count using census population tract maps.
(1980 Census Data)

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles (western NYS not a coastal area).

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile.
(NYSDEC Wetlands Map)

Distance to critical habitat of an endangered species, if 1 mile or less:

There are no federally designated critical habitats in New York State.
(Ozard, 1986)

Land Use

Distance to commerical/industrial area, if 1 mile or less:

Approximately 1/4 mile.
(ES and D&M Site Visit, 1985; USGS Topographic Map: Lewiston Quadrangle, 1980)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Approximately 1/2 mile to Devils Hole State Park.
Approx. 1 mile to Whirlpool State Park.
(USGS Topographic Map: Lewiston Quadrangle, 1980)

Distance to residential area, if 2 miles or less:

Approximately 1/4 mile.
(ES and D&M Site Visit, 1985; USGS Topographic Map: Lewiston Quadrangle, 1980)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Unknown

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within view of the site?

No.
(US Department of Interior, National Park Service (1983). "National Register of Historic Places" and "National Natural Landmarks")

FIRE AND EXPLOSION

1. CONTAINMENT

Hazardous substances present:

Based on review of information during the Phase I Investigation of this site, no evidence of past or present fire and explosion exists at the site.
(Phase I Record Search, 1985-1986)

Type of containment, if applicable:

Not applicable, there are no hazardous wastes on-site which could result in a fire/explosion.
(Interagency Task Force, 1979)

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

No measurements to determine the fire and explosion potential at the site were taken.
(ES and D&M Site Visit, 1985)

Ignitability

Compound used:

No ignitable compounds are known to exist on-site.
(NYSDEC, Registry Sheet, 1983; Interagency Task Force, 1979)

Reactivity

Most reactive compound:

No reactive compounds are known to exist on-site.
(NYSDEC, Registry Sheet, 1983; Interagency Task Force, 1979)

Incompatibility

Most incompatible pair of compounds:

No incompatible compounds are known to exist on-site.
(NYSDEC, Registry Sheet, 1983; Interagency Task Force, 1979)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Hazardous wastes with the potential to create a fire/explosion are not known to exist on-site.

(NYSDEC, Registry Sheet, 1983; Interagency Task Force, 1979)

Basis of estimating and/or computing waste quantity:

Not applicable, no hazardous wastes with the potential to create a fire/explosion are known to exist on-site.
(NYSDEC, Registry Sheet, 1983; Interagency Task Force, 1979)

* * *

3. TARGETS

Distance to Nearest Population

Approximately 1/4 mile
(ES and D&M Site Visit, 1985)

Distance to Nearest Building

Buildings are present on-site
(ES and D&M Site Visit, 1985)

Distance to Sensitive Environment

Distance to wetlands:

None within 1 mile
(NYSDEC Wetlands Map)

Distance to critical habitat:

There are no federally designated critical habitats in New York State.
(Ozard, 1986)

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Approximately 1/4 mile
(ES and D&M Site Visit, 1985)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Approximately 1/2 mile to Devil's Hole State Park
Approx. 1 mile to Whirlpool State Park
(ES and D&M Site Visit, 1985; USGS Topographic Map: Lewiston Quadrangle, 1980)

Distance to residential area, if 2 miles or less:

Approximately 1/4 mile
(ES and D&M Site Visit, 1985)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

None

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Unknown

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

No
(US Department of Interior, National Park Service (1983), "National Register of Historic Places" and "National Natural Landmarks")

Population with 2-Mile Radius

28,897 people
(US Bureau of the Census, 1980)

Buildings Within 2-Mile Radius

7,604 buildings (estimate based on census data: 28,397 people ÷ 3.8 people per house = 7,604 buildings)

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

Based on review of information during the Phase I Investigation of this site, there is no confirmed instance in which contact with hazardous substances at the site has caused injury, illness or death to humans or animals.
(Phase I Record Search, 1985-86)

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Disposal area is located within the plant security fence and 24-hour surveillance is maintained. HRS score = 0
(ES and D&M Site Visit, 1985)

* * *

3. CONTAINMENT

Type of containment, if applicable:

Hazardous waste at the site was disposed of in above-ground waste piles and in the landfill (Interagency Task Force, 1979). In 1981, most of the waste piles were removed for off-site disposal (Walsh, 1981). For HRS scoring, hazardous wastes are accessible to direct contact because the disposal site has not been adequately closed (i.e., cover system).

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

An estimated 2,986 tons of industrial waste from TAM Ceramics was disposed of at the on-site disposal area (Interagency Task Force, 1979). The hazardous wastes disposed on-site consisted of 43 tons of magnesium and 500 tons of iron containing wastes.

Compound with highest score:

Most of the aboveground wastes at the disposal site were removed for off-site disposal in 1981 (**Walsh, 1981**). The type and quantity of hazardous wastes disposed of on-site is unknown. For HRS scoring, either the magnesium or iron is scored (HRS = 3) because the landfilled wastes have not been removed.

* * *

5. TARGETS

Population within one-mile radius

8,972 people
(**1980 Census Tracts**)

Distance to critical habitat (of endangered species)

There are no federally designated critical habitats in New York State.
(**Ozard, 1986**)

HRS REFERENCES*

1. Christoffel, T., NYSDEC, Letter to C. Bosma, 1/31/86.

2. Christoffel, T., NYSDEC, Letter to C. Bosma, 3/11/86.

3. Engineering-Science (ES) and Dames & Moore (D&M) Site Inspection, December, 1985.

4. Freeze, R. A. and J. A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979.

5. Hopkins, M., NCHD, Personal Interview, 11/20/85.

6. Hopkins, M., NCHD, Personal Interview, 5/8/86.

7. Hyde Park Landfill Groundwater Study Results - Occidental Chemical Corporation from NYSDEC Files, 1983.

8. Interagency Task Force on Hazardous Wastes, Draft Report on Hazardous Waste Disposal in Erie and Niagara Counties, New York, March, 1979.

9. McMurry, M., Environmental Analyst, Personal Interview, 1/3/86.

10. NYSDEC, Registry Sheet, 1983.

11. NYS Atlas of Community Water System Sources, NYS Department of Health, 1982.

12. NYS Wetlands Maps.

13. Occidental Chemical Corporation, Pump Well Installation and Pump Test Results, December, 1983.

14. Ozard, J., NYSDEC, Personal Interview, 1/17/86.

15. Sax, Dangerous Properties of Industrial Materials, 6th Edition, 1984.

16. US Bureau of the Census, 1980 Census Tracts.

17. USEPA, Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste Disposal Sites, TAM Ceramics and Hyde Park Landfill, March 1985.

18. US Department of Commerce, National Climatic Center, Climatic Atlas of the United States, 1979.

19. US Geological Survey, Topographic Map Quadrangles, Niagara Falls and Lewiston, 1980.

20. US Department of Commerce, National Climatic Center, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, 1963.

21. US Department of Interior, National Park Service (1983), "National Register of Historic Places" and "National Natural Landmark".

22. Walsh, J., TAM Ceramics, Personal Interview, 12/11/85.

23. Walsh, J., Letter to D. Hurley, 6/1/81.

*For general references, see Appendix A.

REF-1

New York State Department of Environmental Conservation
600 Delaware Avenue, Buffalo, N.Y. 14202-1073

Henry G. Williams
Commissioner

January 31, 1986

Ms. Cathy Bosma
Engineering Science
10521 Rosehaven Street
Fairfax, Virginia 22030

Dear Ms. Bosma:

As you requested in our conversation of January 31, 1986, I am enclosing data obtained from locations on the TAM Ceramics property during the Aquifer Survey and the Perimeter Capping Survey for the Hyde Park Landfill. This data consists of maps and analytical results. I was unable to locate data from inorganic analyses performed on groundwater samples at the site. (Note: NAPL stands for Non-Aqueous Phase Liquid, a viscous fluid flowing from the Hyde Park Landfill).

If you need further clarification of this data or further information, please contact me at (716) 847-4590.

Very truly yours,

Thomas R. Christoffel

Thomas R. Christoffel
Assistant Sanitary Engineer

TRC:jps

Enc.

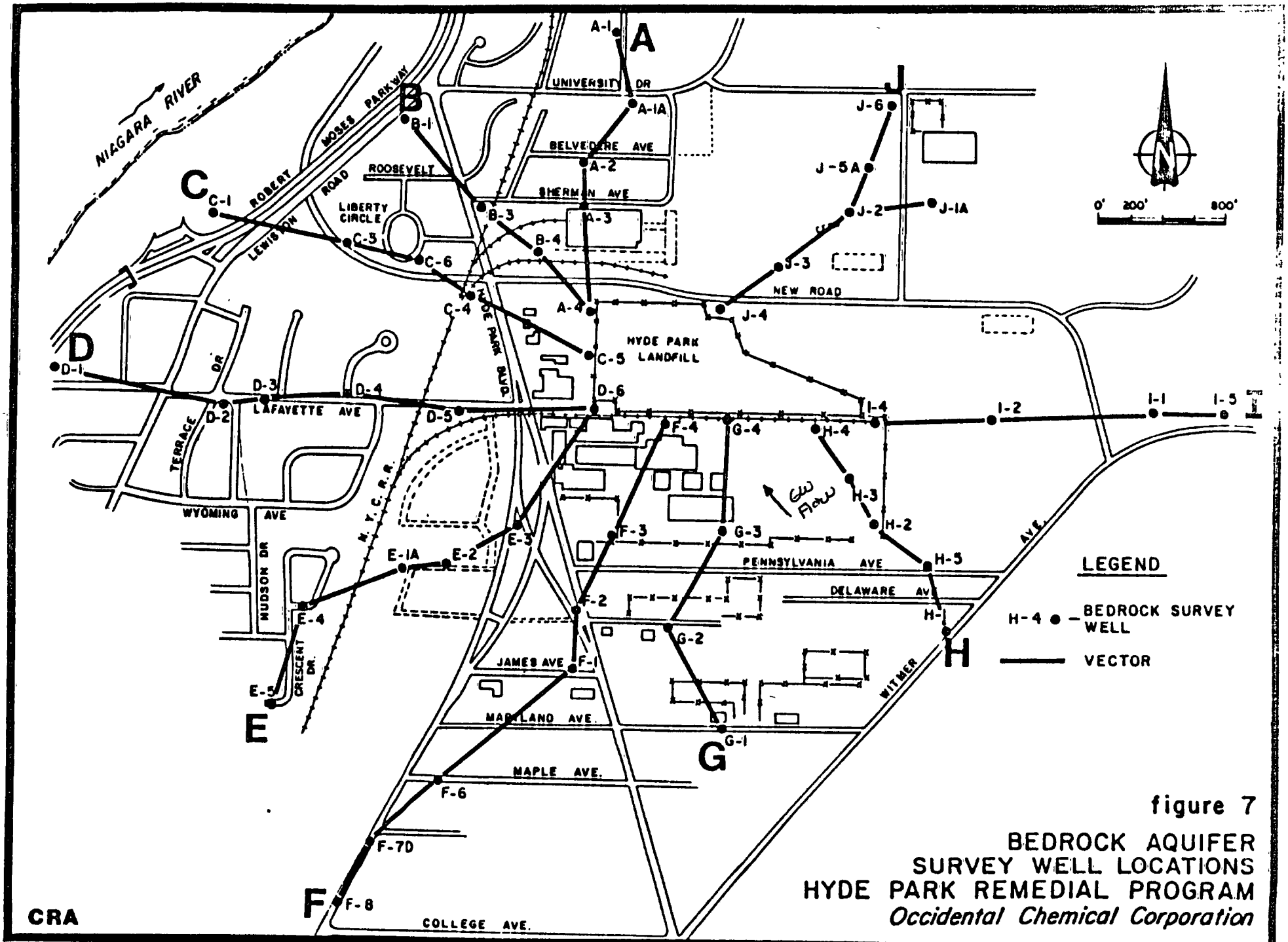

figure 7

BEDROCK AQUIFER
SURVEY WELL LOCATIONS
HYDE PARK REMEDIAL PROGRAM
Occidental Chemical Corporation

REF-1

1069-08/09/83

PAGE 7
REPORT DATE: 23SEP83

OCCIDENTAL CHEMICAL CORPORATION
HYDE PARK SETTLEMENT DECREE

PLUME DEFINITION WELLS, PDW
BY WELL

* = Sample out of range
-1 = Unsuitable value
ND = Not Detected below the given level
COM = Comment

QA CODES: C=Confirmed by GC/MS D=Duplicate
S=Second Phase Organic Z=Unsuitable Sample

ID NUMBER	QA	PH	COND	ANALYSIS: TOC	TOH	PHENOL	MCB	MCBTF	MCT	TRCLB	C56	TCP	TETCLB	HCCH	COMMENT
LIMITS:		4 5- 9.5		200 (mg/L)	0.5 (mg/L)	0.25 (mg/L)				*** 10 (ug/L) ***					
HP 22MAR83 PDW F-2 20-35		7.5	700	3	0.12	0.04	ND	ND	ND	ND	ND	ND	ND	ND	
*HP 23MAR83 PDW F-2 35-50	S	6.9	1800	6	*10.09	*9	*6200	*47	*9200	*1900	ND	*1200	*700	*380	COM
*HP 23MAR83 PDW F-2 65-80		7.4	1650	7	*2.3	*0.42	*1300	*19	*3800	*490	ND	*190	*220	*90	COM
*HP 24MAR83 PDW F-2 95-110		6.2	*9999	ND	*1.15	ND	ND	ND	ND	ND	ND	ND	*14	ND	COM
*HP 22FEB83 PDW F-3 12-27		7.2	800	2	ND	ND	*32	ND	*41	*52	ND	ND	*38	10	COM
*HP 22FEB83 PDW F-3 25-42		8.5	940	87	*10	*10.8	*1100	*310	*6100	*1600	ND	-1	*190	*525	COM
*HP 22FEB83 PDW F-3 41-57		6.5	7200	6	*0.8	ND	*11	ND	*25	*66	ND	ND	*69	*13	COM
*HP 23FEB83 PDW F-3 86-102	S	7.5	2800	96	*49.93	*32.3	*24000	*770	*11000					*1400	COM
*HP 05MAY83 PDW F-4 19-38	S														
*HP 23MAY83 PDW F-4 53-69		7.8	2010	3	*3.4	ND	*580	*41	*3400	*310	ND	*74	*160	*190	
*HP 24MAY83 PDW F-4 81-99		8.1	2600	70	*20	*2.2	*3800	*120	*10000	*510	*126	*1500	*134	*330	
*HP 25MAY83 PDW F-4 111-127		6.3	*9999	2	0.31	ND	*210	ND	*1400	*95	ND	*66	*27	*70	COM
*HP 07MAR83 PDW F-6 10-29	C	7.0	1120	3	0.09	ND	ND	*12	*31	*28	-1	ND	-1	-1	
*HP 07MAR83 PDW F-6 28-44		6.9	1320	2	0.2	ND	ND	ND	*12	-1	-1	ND	-1	-1	COM
*HP 08MAR83 PDW F-6 43-59	C	6.8	3500	7	0.13	ND	*12	ND	ND	ND	ND	ND	ND	ND	COM
*HP 08MAR83 PDW F-6 57-74		6.8	3500	7	0.16	ND	*11	ND	ND	ND	ND	ND	ND	ND	COM

OCCIDENTAL CHEMICAL CORPORATION
HYDE PARK SETTLEMENT DECREE

PLUME DEFINITION WELLS, PDW
BY WELL

*	= Sample out of range
-1	= Unsuitable value
ND	= Not Detected below the given level
COM	= Comment

QA CODES: C=Confirmed by GC/MS D=Duplicate
S=Second Phase Organic Z=Unsuitable Sample

ID NUMBER	QA	PH	COND	ANALYSIS: TOC	TOH	PHENOL	MCB	MCBTF	MCT	TRCLB	C56	TCP	TETCLB	HCCH	COMMENT
LIMITS:		4.5- 9.5		200 (mg/L)	0.5 (mg/L)	0.25 (mg/L)				***	10 (ug/L)	***			
HP 06MAY83 PDW F-7D 15-30		7.4	1320	5	0.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	
*HP 11MAY83 PDW F-7D 97-115		6.4	*9999	10	*2.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 09APR83 PDW F-8 19-28		*11.1	820	7	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 12APR83 PDW F-8 19-43		*10.6	1680	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
*HP 13APR83 PDW F-8 19-58		6.8	*9999	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 18APR83 PDW F-8 19-73		6.9	7500	3	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	
HP 29DEC82 PDW G-1 14-30		6.9	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 03JAN83 PDW G-1 28-45		7.0	1990	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 04JAN83 PDW G-1 43-60		7.3	2400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
HP 04JAN83 PDW G-1 58-75		6.8	5000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
HP 05JAN83 PDW G-1 74-90		7.1	1880	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
HP 06JAN83 PDW G-1 103-120		6.9	5500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 12JAN83 PDW G-1 134-151		8.0	3500	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 01MAR83 PDW G-2 11-26		7.0	1140	82	0.5	*3	ND	*17	*81	*47	ND	ND	*33	*23	
*HP 01MAR83 PDW G-2 25-41		7.3	1620	81	0.17	*1.6	ND	ND	*37	*28	ND	ND	*20	*14	COM
*HP 01MAR83 PDW G-2 40-56	S	7.2	3100	109		*0.5									COM

OCCIDENTAL CHEMICAL CORPORATION
HYDE PARK SETTLEMENT DECREE

PLUME DEFINITION WELLS, PDW
BY WELL

* = Sample out of range
-1 = Unsuitable value
ND = Not Detected below the given level
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QA CODES: C=Confirmed by GC/MS D=Duplicate
S=Second Phase Organic Z=Unsuitable Sample

ID NUMBER	QA	PH	COND	ANALYSIS: TOC	TOH	PHENOL	MCB	MCBTF	MCT	TRCLB	C56	TCP	TETCLB	HCCH	COMMENT
LIMITS:		4.5- 9.5		200 (mg/L)	0.5 (mg/L)	0.25 (mg/L)				***	10 (ug/L)	***			
*HP 02MAR83 PDW G-2 70-86		7.2	2100	2	0.35	ND	ND	*46	*209	*88	*21	ND	*40	*23	
*HP 02MAR83 PDW G-2 100-116		6.6	*9999	17	0.49	ND	*19	*47	*248	*68	ND	ND	*40	*20	COM
*HP 02MAR83 PDW G-2 200-216	D	6.5	*9999	15	0.35	0.2	*19	*45	*243	*63	ND	ND	*38	*20	COM
HP 22FEB83 PDW G-3 9-24		7.1	1720	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 22FEB83 PDW G-3 23-39		7.1	7900	49	*6.83	*7.5	*490	*300	*680	*210	ND	*71	*35	*39	COM
*HP 22FEB83 PDW G-3 38-54	S	6.3	6800	80	*6.83	*5									COM
*HP 24FEB83 PDW G-3 68-84		8.4	8100	27	*6.19	*100	*320	*210	*1200	*420	*16	*320	*110	*87	COM
*HP 25FEB83 PDW G-3 98-114		6.4	*9999	7		*0.8									COM
*HP 25FEB83 PDW G-3 98-114	S	6.4	*9999	7		*1.3									COM
*HP 26FEB83 PDW G-3 128-144		6.3	*9999	3		ND									COM
*HP 26FEB83 PDW G-3 128-144	S	6.3	*9999	3		ND									COM
*HP 18APR83 PDW G-4 14-29	S	5.9	*9999												COM
*HP 18APR83 PDW G-4 28-44	S	5.9	*9999												COM
*HP 18APR83 PDW G-4 41-59	S	7.0	3000												COM
HP 08JUN83 PDW G-5 O/B		7.5	1540	8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 26JAN83 PDW H-2 9-27		6.9	9800	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 01FEB83 PDW H-2 26-42		7.0	990	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM

OCCIDENTAL CHEMICAL CORPORATION
HYDE PARK SETTLEMENT DECREE

PLUME DEFINITION WELLS, PDW
BY WELL

* = Sample out of range
-1 = Unsuitable value
ND = Not Detected below the given l...
COM = Comment

QA CODES C=Confirmed by GC/MS D=Duplicate
S=Second Phase Organic Z=Unsuitable Sample

ID NUMBER	QA	PH	COND	ANALYSIS: TOC	TOH	PHENOL	MCB	MCBTF	MCT	TRCLB	C58	TCP	TETCLB	HCCH	
LIMITS:		4.5- 9	5	200 (mg/L)	0.5 (mg/L)	0.25 (mg/L)				***	10 (ug/L)	***			
HP 01FEB83 PDW H-2 41-57		7.4	1200	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 01FEB83 PDW H-2 56-72		7.3	1340	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 03FEB83 PDW H-2 101-117		7.1	*9999	1	*1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
HP 07FEB83 PDW H-2 116-132		6.8	1850	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	COM
*HP 12MAY83 PDW H-3 10-25		7.1	610	5	*0.76	0.05	ND	*18	*41	-1	-1	-1	-1	-1	COM
*HP 13MAY83 PDW H-3 10-40		7.2	610	5	0.16	ND	ND	ND	ND	*12	ND	ND	*16	ND	
*HP 16MAY83 PDW H-3 39-55		7.2	1700	5	*0.96	0.04	ND	ND	ND	ND	ND	ND	ND		
*HP 16MAY83 PDW H-3 54-70		7.3	2500	8	*2.31	0.05	ND	ND	ND	ND	ND	ND	ND		
*HP 17MAY83 PDW H-3 99-115		6.8	*9999	5	*1.65	ND	ND	ND	ND	ND	ND	ND	ND		
*HP 18MAY83 PDW H-3 129-145		7.0	*9999	ND	0.38	ND	ND	ND	ND	*11	ND	ND	ND	ND	COM
*HP 27MAR83 PDW H-4 13-28	S									ND	ND	ND	ND	ND	COM
*HP 27MAR83 PDW H-4 27-43	S														COM
*HP 28MAR83 PDW H-4 42-58	S														
*HP 05APR83 PDW H-4 87-103	S	6.9	5500												
*HP 05APR83 PDW H-4 102-118	S	6.4	5000												
*HP 06APR83 PDW H-4 118-133	S														COM
															COM

REF-1

REF-2

New York State Department of Environmental Conservation
600 Delaware Avenue, Buffalo, N.Y. 14202-1073

Henry G. Williams
Commissioner

Rec'd 3-14-86

March 11, 1986

Ms. Kathy Bosma
Engineering Science
10521 Rosehaven Street
Fairfax, Virginia 22030

Dear Ms. Bosma:

Enclosed please find copies of analytical results from samples obtained from private wells southeast of TAM Ceramics. A map of the area is also enclosed for your convenience.

If you have any questions, please contact me at 716-847-4590.

Very truly yours,

Thomas R Christoffel

Thomas R. Christoffel
Assistant Sanitary Engineer

TRC:jps

Enc.

REF-L

0001 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45223 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.90
PROGRAM: 107:HYDE PARK - BLOODY RUN REMEDIAL PROGRAM
SOURCE ID: DRAINAGE BASIN:03 GAZETTEER CODE:3155
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LATITUDE:43 07 30. LONGITUDE:79 04 41. Z DIRECTION:
LOCATION: TOWN OF NIAGARA, PRIVATE WELL
DESCRIPTION:UNTULIS RESIDENCE, 2645 PENNSYLVANIA AVE.
REPORTING LAB: TOX:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: NFBR:NIAGARA FALLS-BLOODY RUN
SAMPLE TYPE: 012:FINISHED WATER, UNCHLORINATED - MONITORING
TIME OF SAMPLING: 84/11/14 10: LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T43809	1,3,5-TRICHLOROBENZENE	< 1.0 MCG/L
T44009	1,2,4-TRICHLOROBENZENE	< 1.0 MCG/L
T43909	1,2,3-TRICHLOROBENZENE	< 1.0 MCG/L
T52509	HEXACHLOROBUTADIENE (C-46)	< 1.0 MCG/L
T50309	1,2,4,5-TETRACHLOROBENZENE	< 1.0 MCG/L
T49209	HEXACHLOROCYCLOPENTADIENE (C-56)	< 1.0 MCG/L
T50109	1,2,3,4-TETRACHLOROBENZENE	< 1.0 MCG/L
T46809	HEXACHLOROBENZENE	< 1.0 MCG/L
T15709	HCH,ALPHA	< 1.0 MCG/L
T15809	HCH,BETA	< 1.0 MCG/L
T35609	HCH,GAMMA (LINDANE)	< 1.0 MCG/L
T16009	HCH,DELTA	< 1.0 MCG/L
T44309	2-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T85109	M-MONOCHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T44409	4-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T69309	OCTACHLOROCYCLOPENTENE	< 1.0 MCG/L
T69709	PENTACHLOROBENZENE	< 1.0 MCG/L
T39909	MIREX	< 1.0 MCG/L
T49609	2,4,5-TRICHLOROPHENOL	< 1.0 MCG/L
T82009	O-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82109	M-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82209	P-CHLOROBENZOIC ACID	< 1.0 MCG/L
	FOLLOWING PARAMETERS NOT PART OF TEST PATTERN	
T62009	CHLOROMETHANE	< 1. MCG/L
T61809	BROMOMETHANE	< 1. MCG/L
T41009	VINYL CHLORIDE	< 1. MCG/L
T70209	DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909	CHLOROETHANE	< 1. MCG/L
T61709	TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809	DICHLOROMETHANE	1. MCG/L
T50909	1,1-DICHLOROETHENE	< 1. MCG/L
T51909	1,1-DICHLOROETHANE	< 1. MCG/L
T61209	TRANS-1,2-DICHLOROETHENE	2. MCG/L

**** CONTINUED ON NEXT PAGE ****

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SUBMITTED BY:HOPKINS

REF-2

0002

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

AGE 2 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45223 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.90
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LOCATION: TOWN OF NIAGARA, PRIVATE WELL
TIME OF SAMPLING: 84/11/14 10: LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T39009	CHLOROFORM	< 1. MCG/L
T50809	1,2-DICHLOROETHANE	< 1. MCG/L
T23609	1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609	CARBON TETRACHLORIDE	< 1. MCG/L
T38909	BROMODICHLOROMETHANE	< 1. MCG/L
T61309	1,2-DICHLOROPROPANE	< 1. MCG/L
T61509	TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109	TRICHLOROETHYLENE	2. MCG/L
T44909	DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409	CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709	1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109	2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109	BROMOFORM	< 1. MCG/L
T51809	1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T41209	TETRACHLOROETHENE	< 1. MCG/L
T40909	CHLOROBENZENE	< 1. MCG/L
T49709	1,3-DICHLOROBENZENE	< 1. MCG/L
T44109	1,2-DICHLOROBENZENE	< 1. MCG/L
T44209	1,4-DICHLOROBENZENE	1. MCG/L
T34409	BENZENE	< 1. MCG/L
T39209	TOLUENE	< 1. MCG/L
T51009	ETHYLBENZENE	< 1. MCG/L
T85209	1-CHLOROCYCLOHEXENE-1	< 1. MCG/L
T70409	PARA-XYLENE	< 1. MCG/L
T70309	META-XYLENE	< 1. MCG/L
T51409	ORTHO-XYLENE	< 1. MCG/L
T85309	CUMENE	< 1. MCG/L
T85409	STYRENE	< 1. MCG/L
T85509	P-BROMOFLUOROBENZENE	< 1. MCG/L
T51109	N-PROPYLBENZENE	< 1. MCG/L
T85609	TERT-BUTYLBENZENE	< 1. MCG/L
T85709	O/P-CHLOROTOLUENE	< 1. MCG/L
T51209	BROMOBENZENE	< 1. MCG/L
T50509	META-CHLOROTOLUENE	< 1. MCG/L
T85809	1,3,5-TRIMETHYLBENZENE	< 1. MCG/L
T85909	1,2,4-TRIMETHYLBENZENE	< 1. MCG/L
T86009	P-CYMENE	< 1. MCG/L
T86109	CYCLOPROPYLBENZENE	< 1. MCG/L
T86209	SEC-BUTYLBENZENE	< 1. MCG/L
T86309	N-BUTYLBENZENE	< 1. MCG/L
T86409	2,3-BENZOFURAN	< 1. MCG/L
T65609	NAPHTHALENE	< 5. MCG/L
T39809	PCB,AROCLOR 1221	< 0.05 MCG/L
T38009	PCB,AROCLOR 1016/1242	< 0.05 MCG/L
T30109	PCB,AROCLOR 1254	< 0.05 MCG/L
T41609	PCB,AROCLOR 1260	< 0.05 MCG/L

REF-2

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45224 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.00
PROGRAM; 107:HYDE PARK - BLOODY RUN REMEDIAL PROGRAM
SOURCE ID: DRAINAGE BASIN:03 GAZETTEER CODE:3155
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: TOWN OF NIAGARA PRIVATE WELL
DESCRIPTION:LACHANCE RESIDENCE, 26 33 PENNSYLVANIA AVE.
REPORTING LAB: TOX:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: NFBR:NIAGARA FALLS-BLOODY RUN
SAMPLE TYPE: 012:FINISHED WATER, UNCHLORINATED - MONITORING
TIME OF SAMPLING: 84/11/14 10:30 LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T43809	1,3,5-TRICHLOROBENZENE	< 1.0 MCG/L
T44009	1,2,4-TRICHLOROBENZENE	< 1.0 MCG/L
T43909	1,2,3-TRICHLOROBENZENE	< 1.0 MCG/L
T52509	HEXACHLOROBUTADIENE (C-46)	< 1.0 MCG/L
T50309	1,2,4,5-TETRACHLOROBENZENE	< 1.0 MCG/L
T49209	HEXACHLOROCYCLOPENTADIENE (C-56)	< 1.0 MCG/L
T50109	1,2,3,4-TETRACHLOROBENZENE	< 1.0 MCG/L
T48809	HEXACHLOROBENZENE	< 1.0 MCG/L
T15709	HCH,ALPHA	< 1.0 MCG/L
T15809	HCH,BETA	< 1.0 MCG/L
T35609	HCH,GAMMA (LINDANE)	< 1.0 MCG/L
T16009	HCH,DELTA	< 1.0 MCG/L
T44309	2-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T85109	M-MONOCHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T44409	4-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T69309	OCTACHLOROCYCLOPENTENE	< 1.0 MCG/L
T69709	PENTACHLOROBENZENE	< 1.0 MCG/L
T39909	MIREX	< 1.0 MCG/L
T49609	2,4,5-TRICHLOROPHENOL	< 1.0 MCG/L
T82009	O-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82109	M-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82209	P-CHLOROBENZOIC ACID	< 1.0 MCG/L
	FOLLOWING PARAMETERS NOT PART OF TEST PATTERN	
T62009	CHLOROMETHANE	< 1. MCG/L
T61809	BROMOMETHANE	< 1. MCG/L
T41009	VINYL CHLORIDE	< 1. MCG/L
T70209	DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909	CHLOROETHANE	< 1. MCG/L
T61709	TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809	DICHLOROMETHANE	< 1. MCG/L
T50909	1,1-DICHLOROETHENE	< 1. MCG/L
T51909	1,1-DICHLOROETHANE	< 1. MCG/L
T61209	TRANS-1,2-DICHLOROETHENE	2. MCG/L

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REF-2

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45224 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.90
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LOCATION: TOWN OF NIAGARA PRIVATE WELL
TIME OF SAMPLING: 84/11/14 10:30 LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T39009	CHLOROFORM	< 1. MCG/L
T50809	1,2-DICHLOROETHANE	< 1. MCG/L
T23609	1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609	CARBON TETRACHLORIDE	< 1. MCG/L
T38909	BROMODICHLOROMETHANE	< 1. MCG/L
T61309	1,2-DICHLOROPROPANE	< 1. MCG/L
T61509	TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109	TRICHLOROETHYLENE	2. MCG/L
T44909	DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409	CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709	1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109	2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109	BROMOFORM	< 1. MCG/L
T51809	1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T41209	TETRACHLOROETHENE	< 1. MCG/L
T40909	CHLOROBENZENE	< 1. MCG/L
T49709	1,3-DICHLOROBENZENE	< 1. MCG/L
T44109	1,2-DICHLOROBENZENE	< 1. MCG/L
T44209	1,4-DICHLOROBENZENE	< 1. MCG/L
T34409	BENZENE	1. MCG/L
T39209	TOLUENE	< 1. MCG/L
T51009	ETHYLBENZENE	< 1. MCG/L
T85209	1-CHLOROCYCLOHEXENE-1	< 1. MCG/L
T70409	PARA-XYLENE	< 1. MCG/L
T70309	META-XYLENE	< 1. MCG/L
T51409	ORTHO-XYLENE	< 1. MCG/L
T85309	CUMENE	< 1. MCG/L
T85409	STYRENE	< 1. MCG/L
T85509	P-BROMOFLUOROBENZENE	< 1. MCG/L
T51109	N-PROPYLBENZENE	< 1. MCG/L
T85609	TERT-BUTYLBENZENE	< 1. MCG/L
T85709	O/P-CHLOROTOLUENE	< 1. MCG/L
T51209	BROMOBENZENE	< 1. MCG/L
T50509	META-CHLOROTOLUENE	< 1. MCG/L
T85809	1,3,5-TRIMETHYLBENZENE	< 1. MCG/L
T85909	1,2,4-TRIMETHYLBENZENE	< 1. MCG/L
T86009	P-CYMENE	< 1. MCG/L
T86109	CYCLOPROPYLBENZENE	< 1. MCG/L
T86209	SEC-BUTYLBENZENE	< 1. MCG/L
T86309	N-BUTYLBENZENE	< 1. MCG/L
T86409	2,3-BENZOFURAN	< 1. MCG/L
T65609	NAPHTHALENE	< 5. MCG/L
T39809	PCB,AROCLOR 1221	< 0.05 MCG/L
T38009	PCB,AROCLOR 1016/1242	< 0.05 MCG/L
T38109	PCB,AROCLOR 1254	< 0.05 MCG/L
T41609	PCB,AROCLOR 1260	< 0.05 MCG/L

REF-2

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45225 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.90
PROGRAM: 107:HYDE PARK - BLOODY RUN REMEDIAL PROGRAM
SOURCE ID: DRAINAGE BASIN:03 GAZETTEER CODE:3155
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LATITUDE:43 07 30. LONGITUDE:79 04 41. Z DIRECTION:
LOCATION: TOWN OF NIAGARA PRIVATE WELL
DESCRIPTION:WEBER RESIDENCE 2705 PENNSYLVANIA AVE.
REPORTING LAB: TOX:LAB FOR ORGANIC ANALYTICAL CHEMISTRY
TEST PATTERN: NFBR:NIAGARA FALLS-BLOODY RUN
SAMPLE TYPE: 012:FINISHED WATER, UNCHLORINATED - MONITORING
TIME OF SAMPLING: 84/11/14 10:50 LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T43809	1,3,5-TRICHLOROBENZENE	< 1.0 MCG/L
T44009	1,2,4-TRICHLOROBENZENE	< 1.0 MCG/L
T43909	1,2,3-TRICHLOROBENZENE	< 1.0 MCG/L
T52509	HEXACHLOROBUTADIENE (C-46)	< 1.0 MCG/L
T50309	1,2,4,5-TETRACHLOROBENZENE	< 1.0 MCG/L
T49209	HEXACHLOROCYCLOPENTADIENE (C-56)	< 1.0 MCG/L
T50109	1,2,3,4-TETRACHLOROBENZENE	< 1.0 MCG/L
T48809	HEXACHLOROBENZENE	< 1.0 MCG/L
T15709	HCH,ALPHA	< 1.0 MCG/L
T15809	HCH,BETA	< 1.0 MCG/L
T35609	HCH,GAMMA (LINDANE)	< 1.0 MCG/L
T16009	HCH,DELTA	< 1.0 MCG/L
T44309	2-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T85109	M-MONOCHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T44409	4-CHLOROBENZOTRIFLUORIDE	< 1.0 MCG/L
T69309	OCTACHLOROCYCLOPENTENE	< 1.0 MCG/L
T69709	PENTACHLOROBENZENE	< 1.0 MCG/L
T39909	MIREX	< 1.0 MCG/L
T49609	2,4,5-TRICHLOROPHENOL	< 1.0 MCG/L
T82009	O-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82109	M-CHLOROBENZOIC ACID	< 1.0 MCG/L
T82209	P-CHLOROBENZOIC ACID	< 1.0 MCG/L
	FOLLOWING PARAMETERS NOT PART OF TEST PATTERN	
T62009	CHLOROMETHANE	< 1. MCG/L
T61809	BROMOMETHANE	< 1. MCG/L
T41009	VINYL CHLORIDE	< 1. MCG/L
T70209	DICHLORODIFLUOROMETHANE	< 1. MCG/L
T61909	CHLOROETHANE	< 1. MCG/L
T61709	TRICHLOROFLUOROMETHANE	< 1. MCG/L
T23809	DICHLOROMETHANE	< 1. MCG/L
T50909	1,1-DICHLOROETHENE	< 1. MCG/L
T51909	1,1-DICHLOROETHANE	< 1. MCG/L
T61209	TRANS-1,2-DICHLOROETHENE	6. MCG/L

**** CONTINUED ON NEXT PAGE ****

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SUBMITTED BY:HOPKINS

REF-2

06 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 2 RESULTS OF EXAMINATION PENDING APPROVAL

SAMPLE ID: 45225 SAMPLE RECEIVED:84/11/15/ CHARGE: 46.90
POLITICAL SUBDIVISION:NIAGARA COUNTY:NIAGARA
LOCATION: TOWN OF NIAGARA PRIVATE WELL
TIME OF SAMPLING: 84/11/14 10:50 LAST ACTION DATE:85/01/30

	PARAMETER	RESULT
T39009	CHLOROFORM	< 1. MCG/L
T50809	1,2-DICHLOROETHANE	< 1. MCG/L
T23609	1,1,1-TRICHLOROETHANE	< 1. MCG/L
T36609	CARBON TETRACHLORIDE	< 1. MCG/L
T38909	BROMODICHLOROMETHANE	< 1. MCG/L
T61309	1,2-DICHLOROPROPANE	< 1. MCG/L
T61509	TRANS-1,3-DICHLOROPROPENE	< 1. MCG/L
T41109	TRICHLOROETHYLENE	6. MCG/L
T44909	DIBROMOCHLOROMETHANE	< 1. MCG/L
T61409	CIS-1,3-DICHLOROPROPENE	< 1. MCG/L
T51709	1,1,2-TRICHLOROETHANE	< 1. MCG/L
T61109	2-CHLOROETHYLVINYL ETHER	< 1. MCG/L
T42109	BROMOFORM	< 1. MCG/L
T51809	1,1,2,2-TETRACHLOROETHANE	< 1. MCG/L
T41209	TETRACHLOROETHENE	< 1. MCG/L
T40909	CHLOROBENZENE	< 1. MCG/L
T49709	1,3-DICHLOROBENZENE	< 1. MCG/L
T44109	1,2-DICHLOROBENZENE	< 1. MCG/L
T44209	1,4-DICHLOROBENZENE	< 1. MCG/L
T34409	BENZENE	1. MCG/L
T39209	TOLUENE	< 1. MCG/L
T51009	ETHYLBENZENE	< 1. MCG/L
T85209	1-CHLOROCYCLOHEXENE-1	< 1. MCG/L
T70409	PARA-XYLENE	< 1. MCG/L
T70309	META-XYLENE	< 1. MCG/L
T51409	ORTHO-XYLENE	< 1. MCG/L
T85309	CUMENE	< 1. MCG/L
T85409	STYRENE	< 1. MCG/L
T85509	P-BROMOFLUOROBENZENE	< 1. MCG/L
T51109	N-PROPYLBENZENE	< 1. MCG/L
T85609	TERT-BUTYLBENZENE	< 1. MCG/L
T85709	O/P-CHLOROTOLUENE	< 1. MCG/L
T51209	BROMOBENZENE	< 1. MCG/L
T50509	META-CHLOROTOLUENE	< 1. MCG/L
T85809	1,3,5-TRIMETHYLBENZENE	< 1. MCG/L
T85909	1,2,4-TRIMETHYLBENZENE	< 1. MCG/L
T86009	P-CYMENE	< 1. MCG/L
T86109	CYCLOPROPYLBENZENE	< 1. MCG/L
T86209	SEC-BUTYLBENZENE	< 1. MCG/L
T86309	N-BUTYLBENZENE	< 1. MCG/L
T86409	2,3-BENZOFURAN	< 1. MCG/L
T65609	NAPHTHALENE	< 5. MCG/L
T39809	PCB,AROCLOR 1221	< 0.05 MCG/L
T38009	PCB,AROCLOR 1016/1242	< 0.05 MCG/L
T30109	PCB,AROCLOR 1254	< 0.05 MCG/L
T41609	PCB,AROCLOR 1260	< 0.05 MCG/L
T[illegible]209	PCB,AROCLOR 1248	< 0.05 MCG/L

[illegible] END OF REPORT

ES AND D&M SITE INSPECTION

Observations made during the ES and D&M Site Inspections are provided on US EPA Forms 2070-12 and 2070-13. Field notes were used to complete these EPA Forms, and are not included herein.

REF-4

GROUNDWATER

R. Allan Freeze/John A. Cherry

REF - 4
Freeze + Cherry, 1979.

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

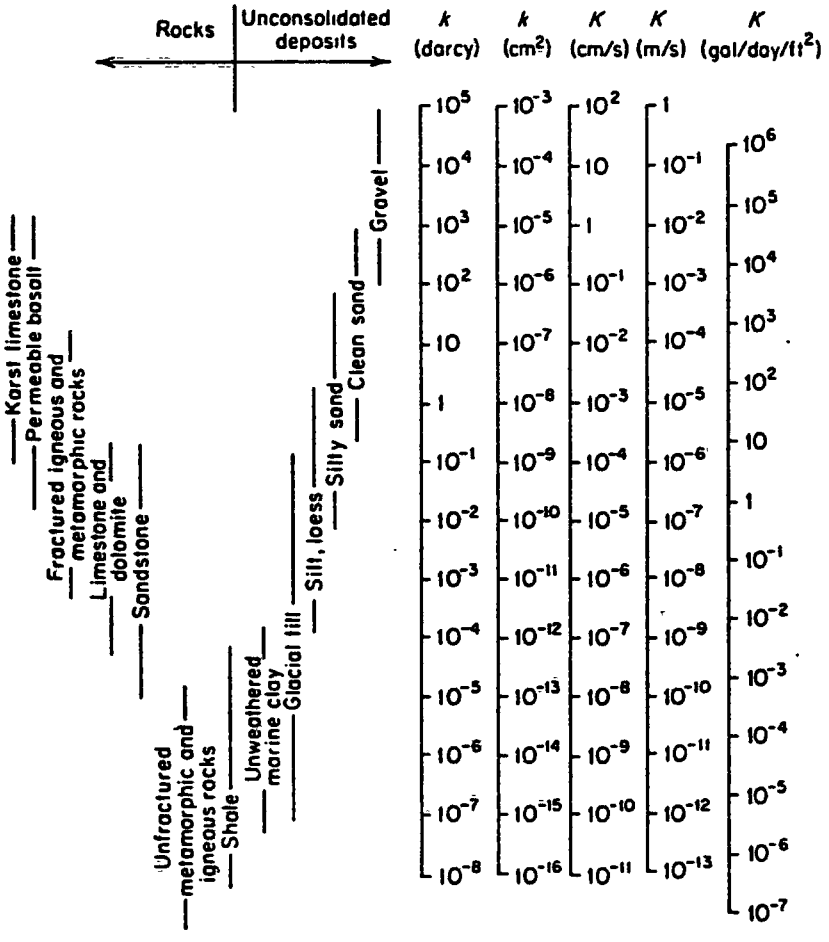


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm^2	ft^2	darcy	m/s	ft/s	U.S. gal/day/ft^2
cm^2	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft^2	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal/day/ft^2	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

REF 5

INTERVIEW FORM

INTERVIEWEE/CODE Mike Hopkins /

TITLE - POSITION

ADDRESS

CITY STATE ZIP

PHONE ( ) RESIDENCE PERIOD TO

LOCATION INTERVIEWER Cathy J. Bosma

DATE/TIME 11/20/85 /

SUBJECT: Carborundum Company, Klobar

REMARKS: Consultant did study for Klobar-Earth Dimensions Inc.. There are 5 private wells in the vicinity of this site. Wittmer Rd. site had these wells listed. (ES did investigation.) These wells are contaminated with volatiles. Hyde Park Landfill has organics: this site is closer to those wells than Carbondum. Other sources of contaminants possible.

Owner: Ronald Reid
Carborundum Co.
P.O. Box 337
Niagara Falls, NY 14302

~~Plant Mgr: Robert Naklitsch~~
3425 Hyde Park Blvd
P.O. Box 339
Niagara Falls, NY 14302

Used to be drum storage site.
No profile report.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE: /s/ M. Hopkins

COMMENTS:

REF-5

INTERVIEW FORM

INTERVIEWEE/CODE Mike Hopkins /

TITLE - POSITION

ADDRESS

CITY STATE ZIP

PHONE ( ) RESIDENCE PERIOD TO

LOCATION INTERVIEWER Cathy J. Barna

DATE/TIME 11-20-85 /

SUBJECT: Carborundum Company, Niagara

REMARKS: Consultant did study for Niagara - Envirosciences, Inc. Since are 5 private wells in the vicinity of this site. Within RI site had this wells listed. (ES did investigation). These wells are contaminated w/ volatiles. Hyde Park Landfill has organics: this site is closer to these wells than Carborundum. Other sources of contaminants possible

Owner: Ronald Reid
Carborundum Co.
P.O. Box 337
Niagara Falls, NY
14302

Plant Mgr: Robert Niklitsch
345 Hyde Park Blvd.
P.O. Box 339
Niagara Falls, NY
14302

LQG to be storage site.
No Profile Report

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE:

COMMENTS:

REF. 6

INTERVIEW FORM

INTERVIEWEE/CODE Mike Hopkins /

TITLE - POSITION Niagara County Health Department

ADDRESS 10th Street and East Falls

CITY Niagara Falls STATE N.Y. ZIP 14303

PHONE (716) 284-3124 RESIDENCE PERIOD _____ TO _____

LOCATION phone interview INTERVIEWER Larry Keefe (Dames and Moore)

DATE/TIME May 8, 1986 / 11:20 a.m.

SUBJECT: groundwater usage in the Niagara Falls area

REMARKS: Regarding the following sites: Great Lakes Carbon, Wurlitzer, Dibacco #2, Adams Generating Plant, Hydraulic Canal, 64th Street, St. Mary's and Bishop Duffy Schools, Silbergeld Junkyard, and Tam Ceramics; the following known groundwater usage applies:

1. The only known drinking water wells are on Pennsylvania Avenue in the town of Niagara. There are 2 wells on Pennsylvania Avenue and 3 on Delaware Avenue (adjacent street).
2. The only known operational industrial well is at Olin Chemical on Buffalo Avenue, City of Niagara Falls. This is a non-contact cooling water usage only.

I agree with the above interview summary:

Signature/Title:

Comments:

REF 6

MAY 15 1986

INTERVIEW FORM

INTERVIEWEE/CODE MIKE HOPKINS /

TITLE - POSITION NIAGARA COUNTY HEALTH DEPT.

ADDRESS 10th STREET & EAST FALLS

CITY NIAGARA FALLS STATE NY ZIP 14303

PHONE (716) 284-3134 . RESIDENCE PERIOD ____ TO ____

LOCATION PHONE INTERVIEW INTERVIEWER LARRY KEEFE (DAMES & MOORE)

DATE/TIME MAY 8, 1986 / 11:20 A

SUBJECT: GROUNDWATER USAGE IN THE NIAGARA FALLS AREA

REMARKS: REGARDING THE FOLLOWING SITES; [1]GREAT LAKES CARBON, [2]WURLITZER, [3]DIBACCO #2, [4]ADAMS GENERATING PLANT, [5]HYDRAULIC CANAL, [6]64th ST, [7]ST. MARY'S & BISHOP DUFFY SCHOOLS, [8]SILBERFELD BOULEVARD, AND [9]TAM CERAMICS; THE FOLLOWING KNOWN GROUNDWATER USAGE APPLIES:

1) THE ONLY KNOWN DRINKING WATER WELLS ARE ON PENNSYLVANIA AVE IN THE TOWN OF NIAGARA. THERE ARE 2 WELLS ON PENN. AVE and 3 on Delaware Ave (Adjacent Street)

2) THE ONLY KNOWN OPERATIONAL INDUSTRIAL WELL IS AT OLIN CHEMICAL ON BUFFALO AVE, CITY OF NIAGARA FALLS. THIS IS A NON-CONTACT Cooling ~~Process~~ WATER USAGE ONLY.

I agree with the above interview summary as corrected:

Signature/Title: Michael E Hopkins, NCHD

Comments:

REF-7 #1

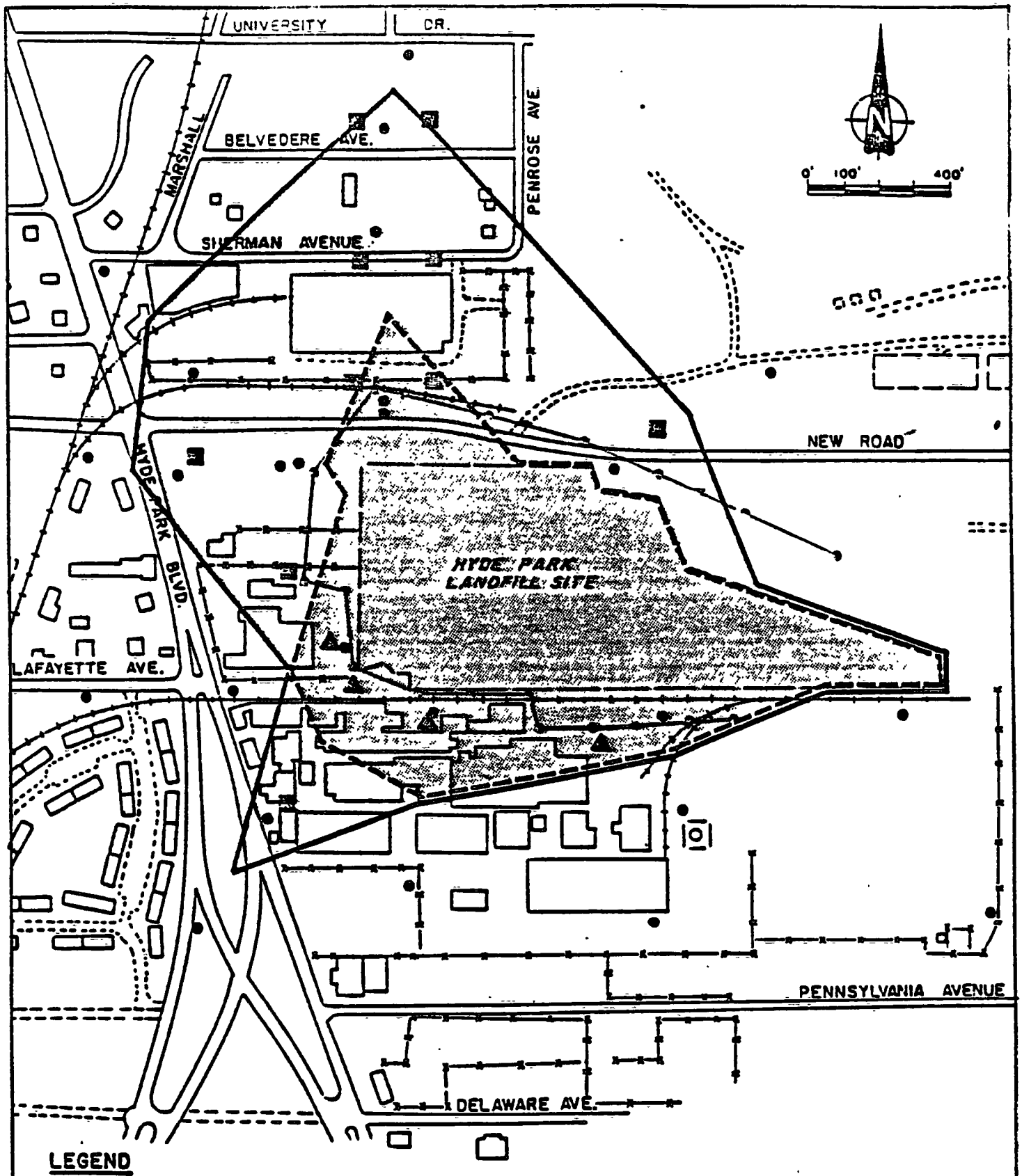


figure 2
OVERBURDEN PLUME SURVEY
HYDE PARK REMEDIAL PROGRAM

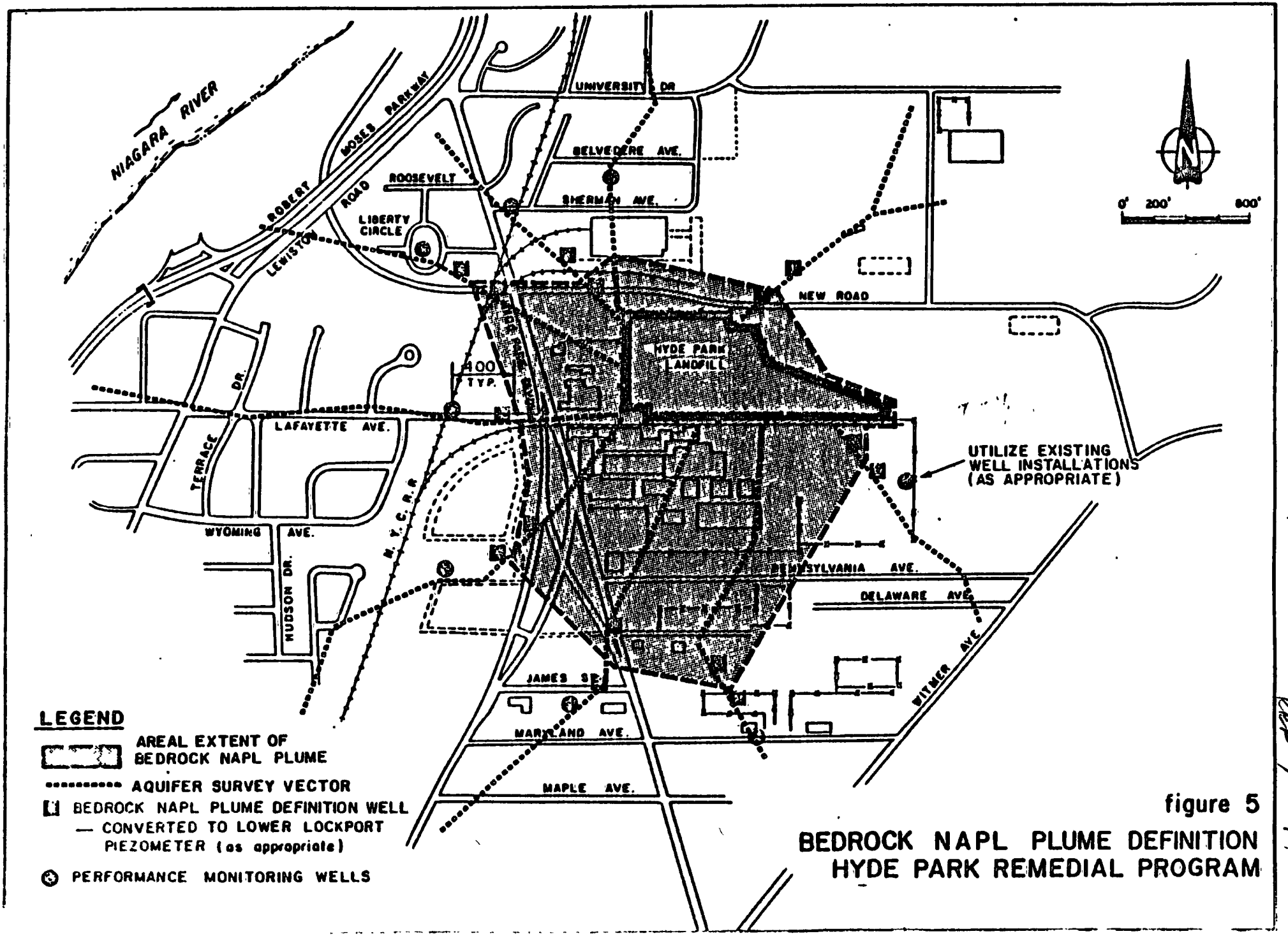


figure 5

BEDROCK NAPL PLUME DEFINITION
HYDE PARK REMEDIAL PROGRAM

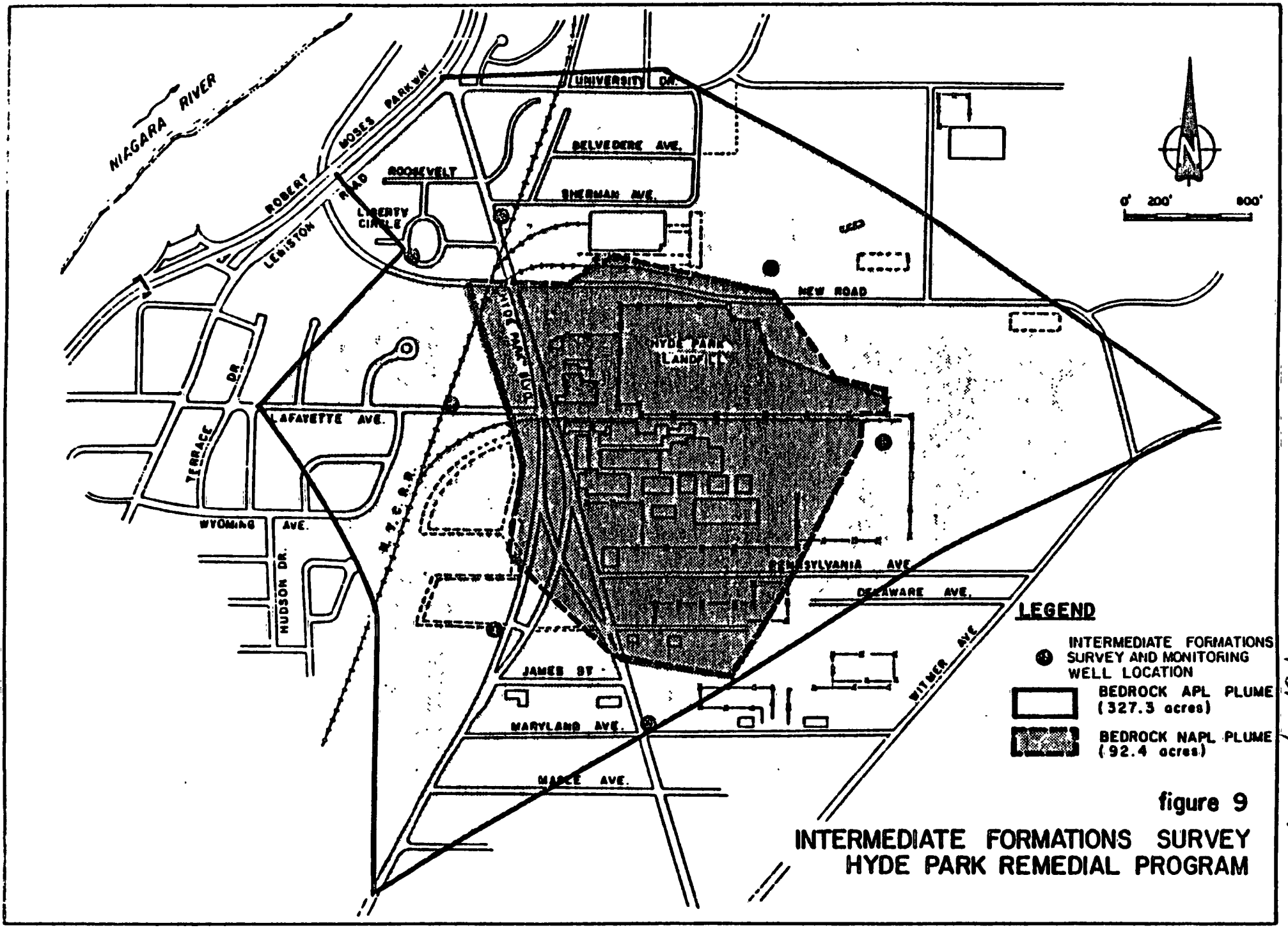


figure 9

INTERMEDIATE FORMATIONS SURVEY
HYDE PARK REMEDIAL PROGRAM

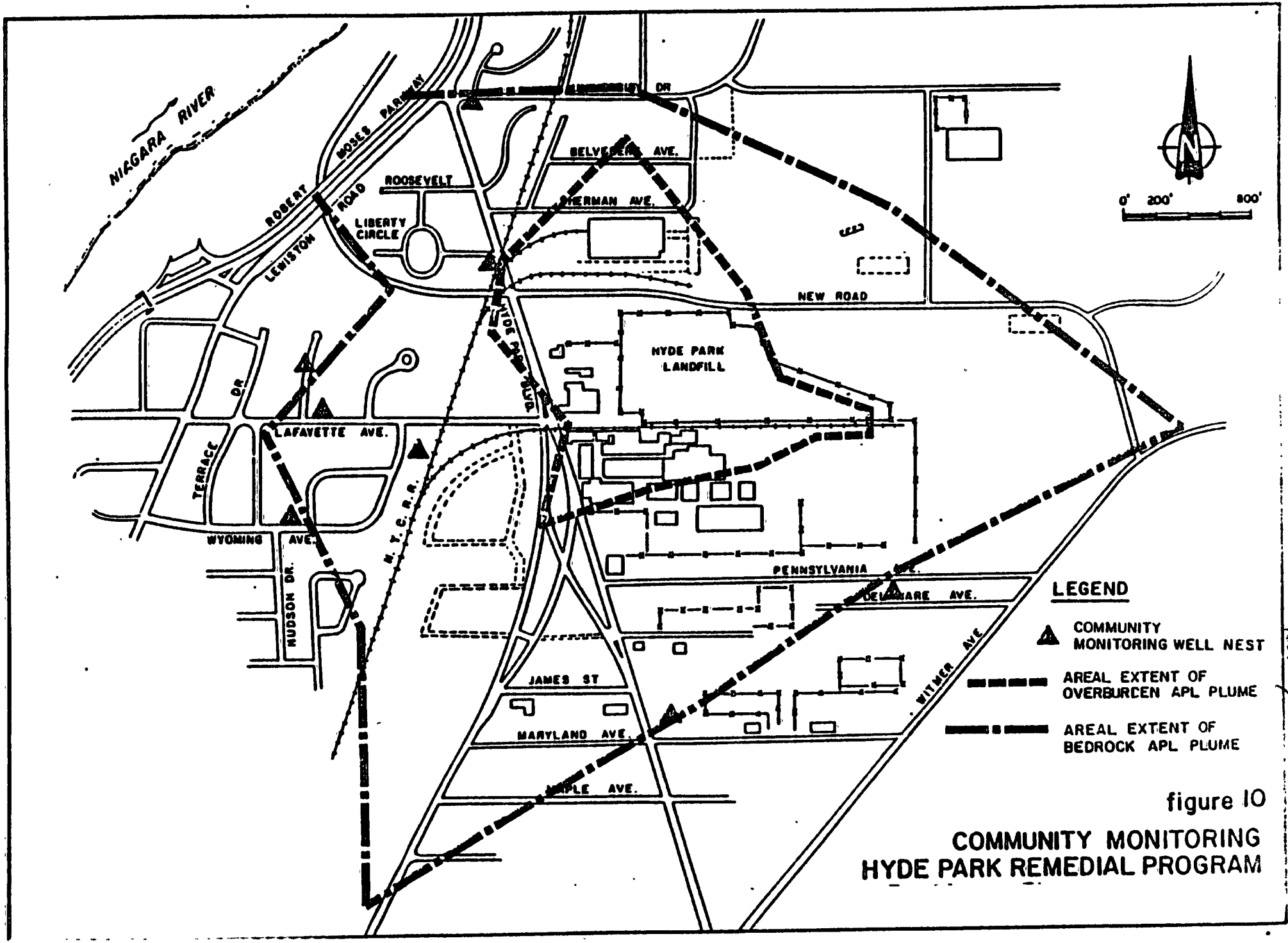


figure 10

COMMUNITY MONITORING
HYDE PARK REMEDIAL PROGRAM

Ref-8

INTERAGENCY TASK FORCE ON HAZARDOUS WASTES

DRAFT REPORT

ON

HAZARDOUS WASTE DISPOSAL

IN

ERIE AND NIAGARA COUNTIES, NEW YORK

March 1979

REF-8

NL INDUSTRIES, INC.
Hyde Park Boulevard Site

The Hyde Park Boulevard disposal site of NL Industries is located in the Town of Niagara. It is bordered on the north by railroad tracks, on the south by Pennsylvania Street, on the east by Witmer Road and on the west by the NL Industries plant. To the north of the railroad tracks is Hooker's Hyde Park landfill.

The surface water nearest to the site is the Niagara River, 0.4 miles to the west. There are no wells close to the site.

The site, 30 to 50 acres in size, was probably used by NL Industries for the disposal of wastes as early at 1906. From 1930 to 1976 when the site was closed, the following amounts of wastes were disposed of there:

Iron carbon titanium alloy	500 tons
Uncalcined titanium oxide	386 tons
Ammonium zirconia carbonate solution	3.6 tons
Magnesium chloride with zirconium impurity	43 tons
Zirconium sodium potassium chloride mixture	3.3 tons
Aluminum oxide with titania impurity	2000 tons
Silica fume with motor oil	50 tons
Ammonia zirconium carbonate	1 ton

The wastes were disposed of in steel drums, steel shells, plastic bottles or, in the case of uncalcined titanium oxide, aluminum oxide and the silica fume, in bulk.

The major health and environmental problem posed by the NL Industries site is the potential cross contamination of groundwater with the adjacent Hyde Park landfill owned by Hooker and the migration of leachate which may contaminate sediments already contaminated by leachate from the Hooker site. In addition, this site has not been properly closed.

REF. - 9

INTERVIEW FORM

INTERVIEWEE/CODE Mike McMurry /

TITLE - POSITION Environmental Analyst

ADDRESS 600 Delaware Avenue

CITY Buffalo STATE NY ZIP 14202

PHONE (716) 847-4551 RESIDENCE PERIOD ____ TO ____

LOCATION DEC Regulatory Affairs-Buffal INTERVIEWER Eric NYE-DIM

DATE/TIME 1/3/86 /

SUBJECT: Wetlands and Flood Info. -Region 9

REMARKS: Met with Mike who gave me access to both wetland and floodway maps for the local region. Also left site locations for the identification of wildlife critical habitat and National Wildlife Refuges.

There are no wetlands within 2 miles of the site

I agree with the above interview summary:

Signature/Title:

Comments:

INTERVIEW FORM

INTERVIEWEE/CODE ~~MC Murry~~ Mc Murray MIKE ~~MACMURRY~~ /

TITLE - POSITION ENVIRONMENTAL ANALYST

ADDRESS 600 Delaware Ave

CITY Buffalo STATE N.Y. ZIP 14202

PHONE (716) ~~649-8175~~ 847-4551 . RESIDENCE PERIOD _____ TO _____

LOCATION DEC REGULATORY AFFAIRS, BUFFALO INTERVIEWER ERIC NYE - DIM

DATE/TIME 1/3/86 /

SUBJECT: WETLANDS & FLOOD INFO - REGION 9

REMARKS: MET WITH MIKE WHO GAVE ME ACCESS TO BOTH WETLAND AND FLOODWAY MAPS FOR THE LOCAL REGION. /

~~X~~ ALSO LEFT SITE LOCATIONS FOR THE IDENTIFICATION OF WILDLIFE CRITICAL HABITAT & NATIONAL WILDLIFE REFUGES

There are no wetlands within 2 miles of the site

I agree with the above interview summary:

Signature/Title: Michael J McMurray, Environmental Analyst

Comments:

(47-15-11 (10/83)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SOLID AND HAZARDOUS WASTE

INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

PRIORITY CODE: 2a SITE CODE: 932028

NAME OF SITE: TAM Ceramics, Inc. REGION: 9

STREET ADDRESS: 4511 Hyde Park Boulevard

(TOWN)/CITY: Niagara COUNTY: Niagara

NAME OF CURRENT OWNER OF SITE: TAM Ceramics, Inc.

ADDRESS OF CURRENT OWNER OF SITE: 4511 Hyde Park Boulevard, Niagara Falls, NY

TYPE OF SITE: OPEN DUMP [X] STRUCTURE [ ] LAGOON [ ]
LANDFILL [ ] TREATMENT POND [ ]

ESTIMATED SIZE: 30 ACRES

SITE DESCRIPTION:

Site has been used as a storage area for obsolete equipment. Furnace linings and various metallic salt residues were deposited as surface fill. The site is immediately adjacent to the Hooker Chemical Hyde Park Landfill. Migration of chemicals through the overburden into sewers on the TAM plant site has been observed. The ongoing investigation at the Hyde Park landfill will determine the extent of contamination of the TAM ceramics site. Remediation program to be implemented by Occidenal Chemical Corporation at Hyde Park will address contamination on the TAM site.

HAZARDOUS WASTE DISPOSED: CONFIRMED [X] SUSPECTED [ ]

TYPE AND QUANTITY OF HAZARDOUS WASTES DISPOSED:

TYPE	QUANTITY (POUNDS, DRUMS, TONS, GALLONS)
Uncalcined titanium oxide, ammonium	About 3,000 tons
Zirconium carbonate, zirconium,	
Alumium oxide, iron-carbon-titanium	
alloy, silica fume	

TIME PERIOD SITE WAS USED FOR HAZARDOUS WASTE DISPOSAL:

_____, 19 30 TO _____, 19 76

OWNER(S) DURING PERIOD OF USE: NL Corporation

SITE OPERATOR DURING PERIOD OF USE: Same

ADDRESS OF SITE OPERATOR: 4511 Hyde Park Boulevard, Niagara Falls, NY

ANALYTICAL DATA AVAILABLE: AIR ☐ SURFACE WATER ☐ GROUNDWATER ☒
SOIL ☒ SEDIMENT ☐ NONE ☐

CONTRAVENTION OF STANDARDS: GROUNDWATER ☒ DRINKING WATER ☐
SURFACE WATER ☐ AIR ☐

SOIL TYPE: Interbedded silty clay, clayey silt, monor sand & gravel

DEPTH TO GROUNDWATER TABLE: 10-15'

None against site owner. State and Federal settlement agreement wi

LEGAL ACTION: TYPE: Occidental Chem. STATE ☐ FEDERAL ☐

STATUS: IN PROGRESS ☐ COMPLETED ☐

REMEDIAL ACTION: PROPOSED ☒ UNDER DESIGN ☐

IN PROGRESS ☐ COMPLETED ☐

NATURE OF ACTION: Capping, overburden & bedrock collection systems

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Materials disposed by site owner are considered to present little or no environmental problems. The site is contaminated by chemicals that have migrated from the Hyde Park landfill in the overburden and the bedrock. Surveys have been conducted by Occidental Chemical and data is presently being assessed for development of remediation project.

ASSESSMENT OF HEALTH PROBLEMS:

NO FINAL DETERMINATION

PERSON(S) COMPLETING THIS FORM:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAME Asst. Chemical Engr.

TITLE Peter Buechi

NAME Assoc. Sanitary Engr.

TITLE November 22, 1983

DATE: _____

NEW YORK STATE DEPARTMENT OF HEALTH
R. Tramontano

NAME Bur. Tox. Subst. Assess.

TITLE _____

NAME _____

TITLE 12/83

DATE: _____

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE
DEPARTMENT OF HEALTH

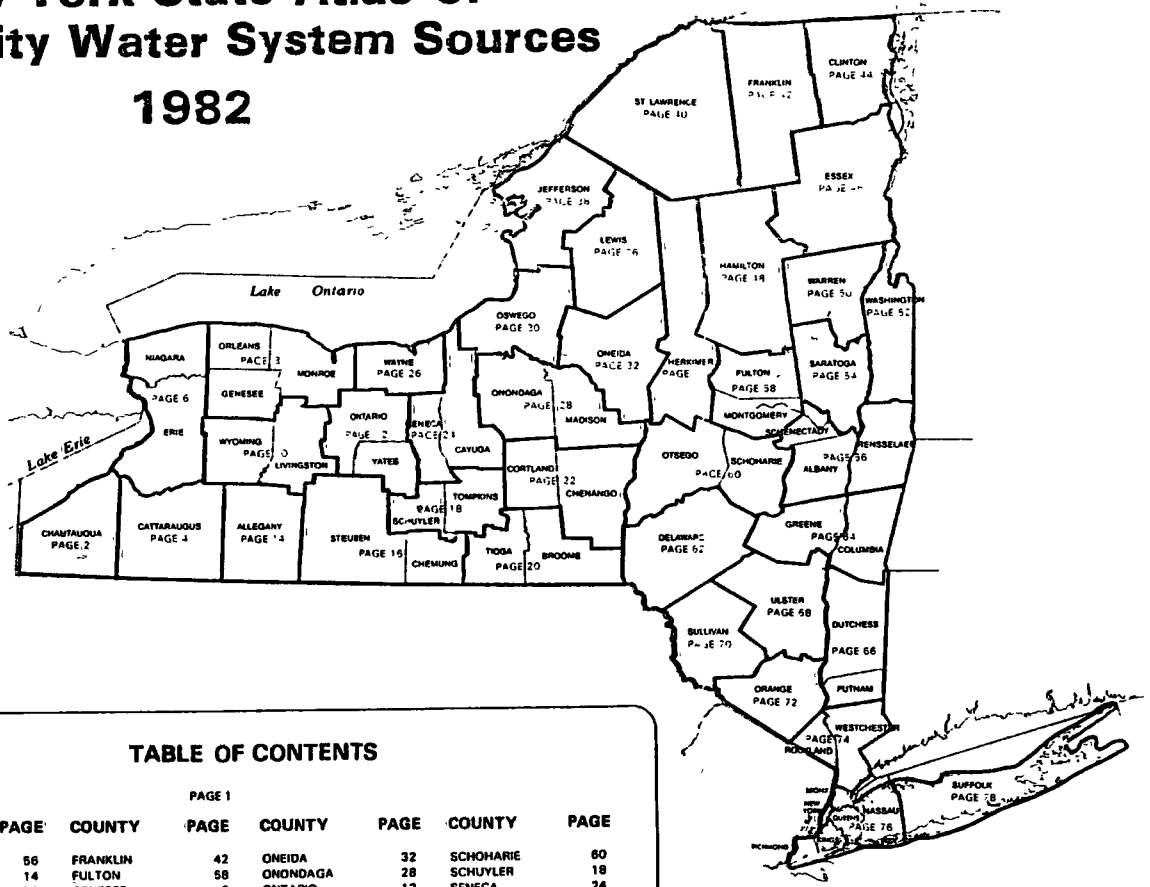


TABLE OF CONTENTS

LEGEND

BOUNDARIES AND PLACES

International
State
County
Town
Indian Reservation
City — Village
Unincorporated Place — Federal Reservation
Built-up Area (Over 25 000 population including any contiguous city or village)

CLASSIFICATION OF POPULATED PLACES

100 000 or more — YONKERS
50 000 to 100 000 — Levittown
12 500 to 50 000 — Poughkeepsie
2 500 to 12 500 — Hampton Bays
250 to 2 500 — Boiceville
250 or less

TRANSPORTATION

Highways
- Divided Highways — UNDER CONSTRUCTION
  - Full Control of Access
  - Partial or No Control of Access
- Undivided Highway
- Interchange — INTERCHANGE NUMBER — FULL — PARTIAL
- Touring Route (State U S Interstate) or State Parkway
- Touring Route Markers — State U S Interstate

Railroads
- Operating Line — Service Discontinued
- Operator — DELAWARE AND HUDSON
- Owner (If Other than Operator) — (PENN CENTRAL)
- Company Having Trackage Rights — (CONRAIL)

Airports (Open to the Public Military)
- Runway under 4000' — Runway over 4000'

Rest Areas
- Food Gas Rest Rooms — Rest Rooms
- Gas Rest Rooms — Parking Only

RECREATION FACILITIES

- State or National Recreation Area
- State Campground
- State Boat Launching Site
- State Canal Park
- State Fish Hatchery
- Other State Recreation Site

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Akron Village (See No 1 Wyoming Co, Page 10)	3640	
1	Alden Village	3460	Wells
2	Angola Village	8500	Lake Erie
3	Buffalo City Division of Water	357870	Lake Erie
4	Caffee Water Company	210	Wells
5	Collins Water District #3	704	Wells
6	Collins Water Districts #1 and #2	1384	Wells
7	Erie County Water Authority (Sturgeon Point Intake)	375000	Lake Erie
8	Erie County Water Authority (Van DeWater Intake)	NA	Niagara River - East Branch
9	Grand Island Water District #2	9390	Niagara River
10	Holland Water District	1670	Wells
11	Lawtons Water Company	138	Wells
12	Lockport City (Niagara Co)		Niagara River - East Branch
13	Niagara County Water District (Niagara Co)		Niagara River - West Branch
14	Niagara Falls City (Niagara Co)		Niagara River - West Branch
15	North Collins Village	1500	Wells
16	North Tonawanda City (Niagara Co)		Niagara River - West Branch
17	Orchard Park Village	3671	Pipe Creek Reservoir
18	Springville Village	4169	Wells
19	Tonawanda City	18538	Niagara River - East Branch
20	Tonawanda Water District #1	91269	Niagara River
21	Wanakah Water Company	10750	Lake Erie
Non Municipal Community			
22	Aurora Mobile Park	125	Wells
23	Bush Gardens Mobile Home Park	270	Wells
24	Circle B Trailer Court	50	Wells
25	Circle Court Mobile Park	125	Wells
26	Creekside Mobile Home Park	120	Wells
27	Donnelly's Mobile Home Court	99	Wells
28	Gowanda State Hospital	NA	Clear Lake
29	Hillside Estates	160	Wells
30	Hunters Creek Mobile Home Park	150	Wells
31	Knox Apartments	NA	Wells
32	Maple Grove Trailer Court	72	Wells
33	Millgrove Mobile Park	100	Wells
34	Perkins Trailer Park	75	Wells
35	Quarry Hill Estates	400	Wells
36	Springville Mobile Park	114	Wells
37	Springwood Mobile Village	132	Wells
38	Taylors Grove Trailer Park	39	Wells
39	Valley View Mobile Court	42	Wells
40	Villager Apartments	NA	Wells

NIAGARA COUNTY

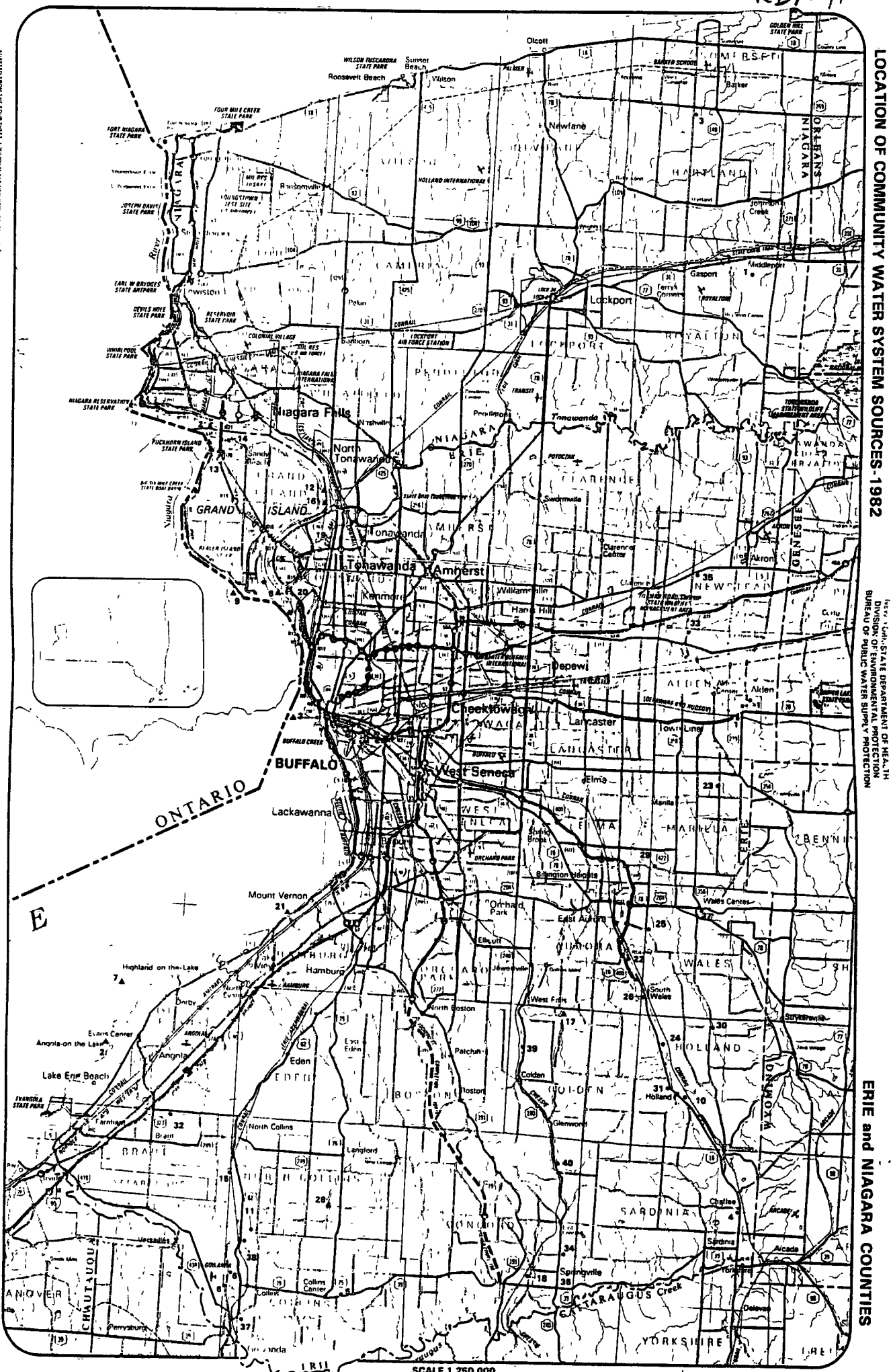
ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Lockport City (See No 12, Erie Co)	25000	
1	Middleport Village	2000	Wells (Springs)
	Niagara County Water District (See No 13, Erie Co)	48	
2	Niagara Falls City (See also No 14 Erie Co)	77384	Niagara River - East Branch
	North Tonawanda City (See No 16 Erie Co)	36000	
Non Municipal Community			
3	Country Estates Mobile Village	28	Wells

REF 11

REF-11

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

ERIE and NIAGARA COUNTIES



ADAPTED FROM THE FOUR SHEET 1:250,000 SCALE NEW YORK STATE MAP COMPILED BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION

N.Y. STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

NYS WETLANDS MAPS

NYS Wetlands Maps were reviewed during the Phase I investigation. Individual maps for each site were not obtained and are, therefore, not included in the Phase I reports. Site specific information collected concerning the location of a wetland within 1 mile of a given site is recorded in the documentation section of each report.

REF- 13

RECEIVED
DEC 0 o 1983

Occidental Chemical Corporation
HOOKER Industrial & Specialty Chemicals

PUMP WELL INSTALLATION and PUMP TEST RESULTS

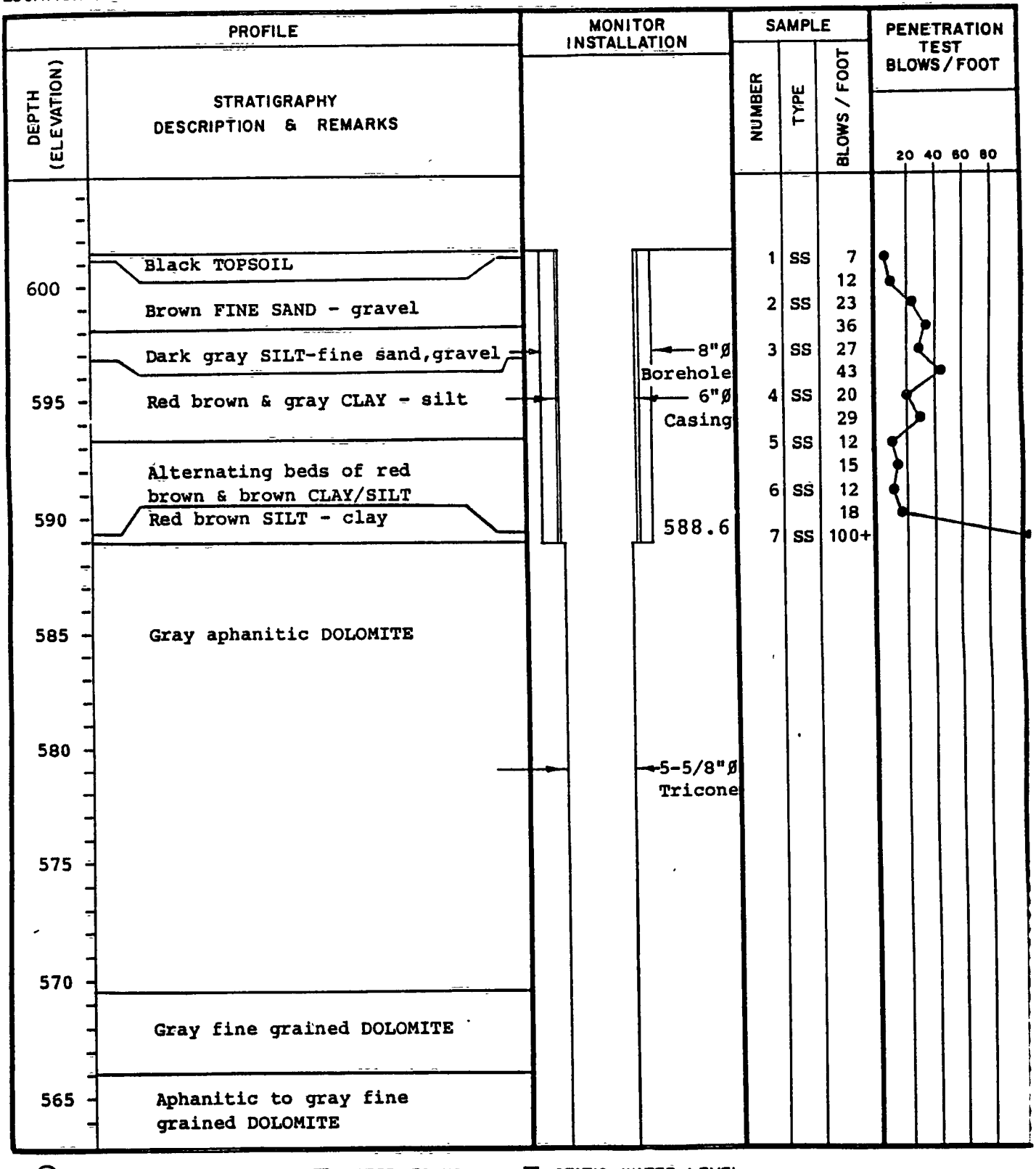
Hyde Park Remedial Program
December, 1983

Volume II - Appendices

REF-13

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : HYDE PARK AQUIFER SURVEY
HOLE Nº: F-4A
JOB Nº : 9-1069
DATE COMPLETED: SEPTEMBER 20, 1983
CLIENT : OCCIDENTAL CHEMICAL CORPORATION
GEOLOGIST/ENGINEER: W. CLARKE/J. KAY
HOLE TYPE : 8"Ø HOLLOW STEM AUGERS/NX CORE
GROUND ELEVATION: 601.2
LOCATION : TAM PROPERTY - S.W. CORNER OF LANDFILL
TOP OF PIPE ELEVATION: 601.72



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

REF-13

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: HYDE PARK AQUIFER SURVEY
JOB Nº: 9-1069
CLIENT: OCCIDENTAL CHEMICAL CORPORATION
HOLE TYPE: 8"Ø HOLLOW STEM AUGERS/NX CORE
LOCATION: TAM PROPERTY - S.W. CORNER OF LANDFILL

HOLE Nº: F-4A - Page 2
DATE COMPLETED: SEPTEMBER 20, 1983
GEOLOGIST/ENGINEER: W. CLARKE/J. KAY
GROUND ELEVATION: 601.2
TOP OF PIPE ELEVATION: 601.72

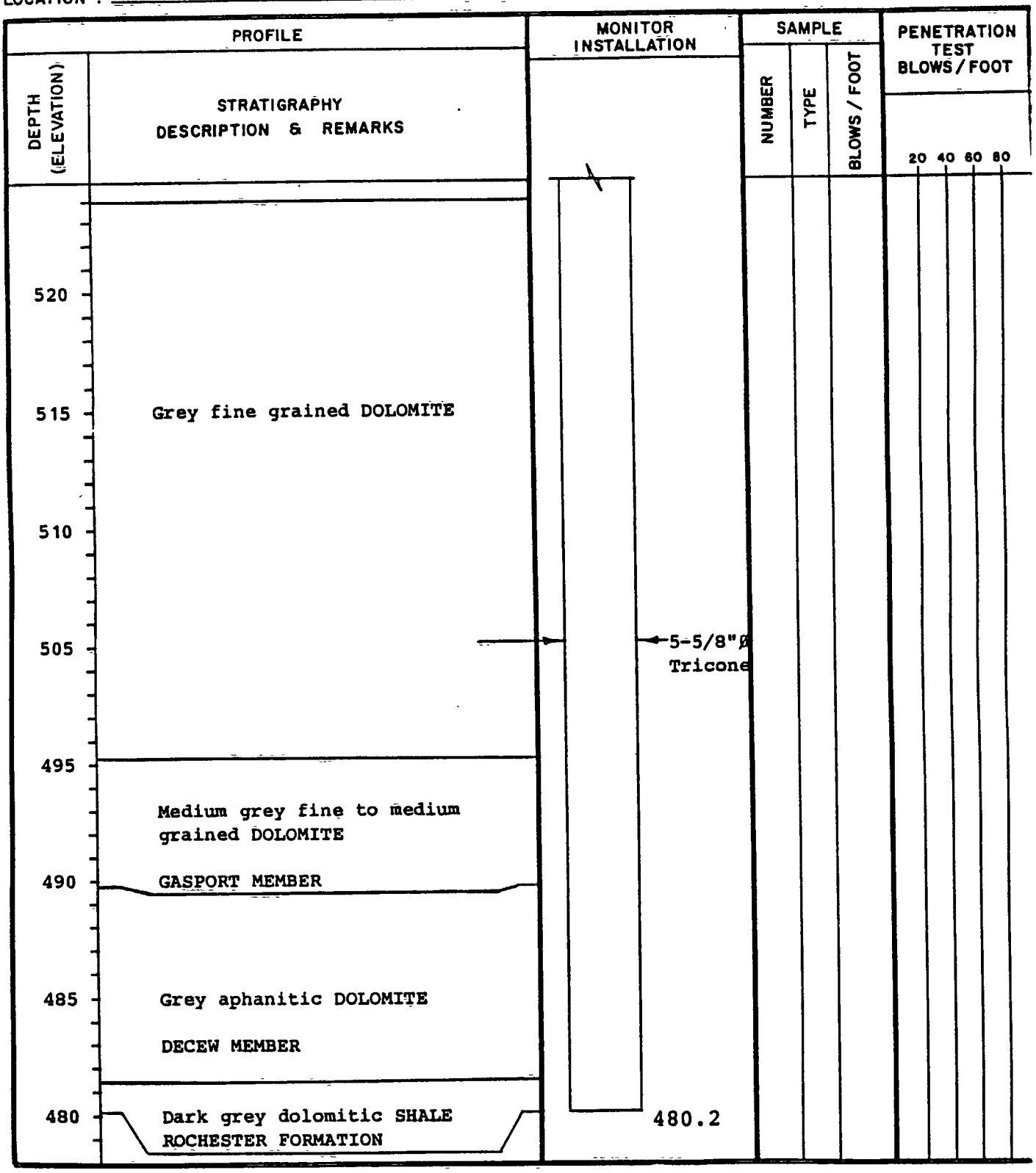
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
560	Aphanitic to grey fine grained DOLOMITE					
555	Grey aphanitic DOLOMITE					
550						
545		5-5/8"Ø Tricone				
540						
535						
530						
525						

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

REF-13

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : HYDE PARK AQUIFER SURVEY
HOLE Nº: F-4A - Page 3
JOB Nº : 9-1069
DATE COMPLETED: SEPTEMBER 20, 1983
CLIENT : OCCIDENTAL CHEMICAL CORPORATION
GEOLOGIST/ENGINEER: W. CLARKE/J. KAY
HOLE TYPE : 8"Ø HOLLOW STEM AUGERS/NX CORE
GROUND ELEVATION: 601.2
LOCATION : TAM PROPERTY - S.W. CORNER OF LANDFILL
TOP OF PIPE ELEVATION: 601.72



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

REF-13

F-4A
Page 1
August 22, 1983
Crew Members: S. Dyer, L. Shaner
Ground Elevation: 601.1

SAMPLE	DEPTH	BLOWCOUNTS	RECOVERY	DESCRIPTION	MOISTURE
1	0.0-0.2'	3-4-6-6	4"	Black topsoil - some vegetation	Moist
	0.2-2.0'			Brown fine sand - some gravel	Moist
2	2.0-4.0'	11-12-17-19	0"	Auger cuttings show moist, dark brown fine sand and silt	
3	4.0-4.3'	11-16-18-25	18"	Dark gray silt - some fine sand - some gravel - trace vegetation	Moist
	4.3-6.0'			Mottled red, brown and gray clay - some silt - trace fine gravel - (NATIVE)	Moist
4	6.0-8.0'	9-11-15-14	5"	Mottled red, brown and gray clay - some silt	Moist
5	8.0-10.0'	5-7-8-7	24"	Red brown and brown alternating clay and silt beds	Moist
6	10.0-12.0	6-6-8-10	9"	Red brown and brown alternating clay and silt beds	Moist
7	12.0-12.2	50/.2	2"	Red brown silt - some clay - trace gravel (till) - gray aphanitic dolomite fragments in tip of spoon	Moist-wet
	12.2-12.5'			- Augered through	
	12.5'			- Auger refusal	

F-4A
Page 2
Bedrock Regime

RUN NO.	DEPTH	DATE	RECOVERY	DESCRIPTION
1	12.5-20.4'	09/13&14/83	40"	Gray Aphanitic Dolomite - thin beds - highly fractured (frequent core blocks in core barrel)
2	20.4-30.2'	09/13&14/83	106"	Gray Aphanitic Dolomite - thin to medium beds - some gypsum associated with shale partings - frequent fractures (along partings)
3	30.2-32.1'	09/13&14/83	21"	Gray Aphanitic Dolomite - thin to medium beds - some gypsum associated with shale partings - frequent fractures (along partings) - slight chemical odor - trace non-aqueous phase present
4	32.1-35.9'	09/14,15&19/83	63"	Gray Fine Grained Dolomite - medium bed - vesicular to vuggy - occasional stylolite - occasional fracture
	35.9-38.9'	09/14,15&19/83		Gray Aphanitic to Fine Grained Dolomite - thin to medium bed - occasional dark gray shale partings - some fractures (along partings)
5	38.9-43.4'	09/14,15&19/83	72"	Gray Aphanitic Dolomite - thin to medium bed - occasional dark gray shale partings - occasional vug (1/4-1"Ø) usually with dolomite/gypsum inclusion - occasional fracture
6	43.4-47.1'	09/14,15&19/83	45"	Gray Aphanitic Dolomite - thin to medium bed - occasional dark gray shale partings - occasional vug (1/4-1"Ø) usually with dolomite/gypsum inclusion - occasional fractures
7	47.1-62.1'	09/19/83	179"	Gray Aphanitic Dolomite - thin to medium beds - some dark gray shale partings - some fractures (along partings) - occasional vugs (<1/2"Ø)

REF-13

Bedrock Regime

RUN NO.	DEPTH	DATE	RECOVERY	DESCRIPTION
8	62.1-77.2	09/19/83	171"	Gray Aphanitic Dolomite becoming Fine Grained with Depth - medium to thick beds - frequent dark gray shale partings - frequent fractures (along shale partings) - occasional stylolite
9	77.2-92.2'	09/20/83	180"	Gray Fine Grained Dolomite - medium to thick beds - some dark gray shale partings - some fractures (along shale partings)
10	92.1-106.1'	09/20/83	180"	Gray Fine Grained Dolomite becoming Aphanitic at Depth - thin to medium beds - some dark gray shale partings - some fractures (along shale partings) - occasional vug (<1/2"Ø)
	106.1-107.1'			Medium Gray Fine to Medium Grained Dolomite - medium beds - fossiliferous (abundant crinoids) - GASPORT MEMBER
11	107.1-111.4	09/20/83	137"	Medium Gray Fine to Medium Grained Dolomite - medium to thick beds - fossiliferous (abundant crinoids) - occasional stylolite - occasional fractures - GASPORT MEMBER
	111.4-119.1'			Gray Aphanitic Dolomite - thin to medium beds - some dark gray shale partings - some fractures (along shale partings) - thick bed (>1') of gray silt (rock flour) from 113.0-118.5 - appears to be product of extensive natural alteration by groundwater movement - DECEW MEMBER

NOTE: Borehole cored with standard (3"Ø) NX bit to 119.1 feet. Borehole reamed with 3-3/4"Ø tricone to about 36 feet. Borehole reamed with 5-5/8"Ø tricone to 121.0 feet to intersect the Rochester Formation.

REF-14

INTERVIEW FORM

INTERVIEWEE/CODE John Oyard /

TITLE - POSITION Senior Wildlife Biologist, Significant Habitat Unit

ADDRESS NYSDEC Wildlife Resources Center, Building 8

CITY Delmar STATE N.Y. ZIP 12054

PHONE (518) 439-7486 RESIDENCE PERIOD ____ TO ____

LOCATION phone conversation INTERVIEWER Lisa A. Ryan

DATE/TIME Jan 17, 1986 @ 3:00

SUBJECT: Sensitive Environments in N.Y.

REMARKS:

- There are no federally designated critical habitats of endangered species located within New York State.

- There are 16 map sets (1:250000) which show ecologically significant areas within the state and copies will be sent to us for future use.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE:

COMMENTS:

REF-14

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I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE: /s/ John W. Ozard

COMMENTS: The 1:250000 scale maps show state potent. significant wildlife habitats.

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:
Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Weisburger

VNR VAN NOSTRAND REINHOLD COMPANY
New York

TOXICITY DATA: 2 CODEN:
orl-rat LD50:550 mg/kg AIHAAP 23,95,62
ihl-rat LCLo:8000 ppm/4H AIHAAP 23,95,62

THR: MOD via oral and inhal routes.
Fire Hazard: Dangerous; see ethers.
To Fight Fire: Water may be ineffective. Use alcohol foam, dry chemical, mist.
Disaster Hazard: When heated to decomp it yields acrid, irr fumes. Becomes shock and heat sensitive on storage.

ALMOND OIL

Fixed, non-drying oil; oily liquid. Composition: oleic, linoleic, myristic, palmitic acids. d: 0.910-0.915 @ 25°/25°.

SYNS:
ALMOND OIL EXPRESSED
ALMOND OIL SWEET

THR: A weak sensitizer. Contact dermatitis may result from local contact.
Fire Hazard: Slight, when exposed to heat or flame.
To Fight Fire: Use alcohol foam, dry chemical, water, mist.

ALMOND OIL, BITTER

Composition: Chief known constituents are benzaldehyde, hydrocyanic acid, benzaldehyde cyanhydrin. bp: 179°; d: 1.045-1.070 @ 15°

THR: Unknown. Depends upon purity of sample. An allergen. Can be quite toxic if it has not been separated from its hydrogen cyanide. Weak sensitizer; may cause contact dermatitis.
Fire Hazard: Slight, when exposed to heat or flame.
Disaster Hazard: Dangerous; see cyanides.

ALPRENOL HYDROCHLORIDE

CAS RN: 13707885 NIOSH #: UA 5425000
mf: $C_{15}H_{23}NO_2 \cdot ClH$; mw: 285.85

SYNS:
1-(O-ALLYLPHENOXY)-3-(ISOPROPYLAMINO)-2-PROPANOL HYDROCHLORIDE
OXPRENOLOL

TOXICITY DATA: 3 CODEN:
ipr-mus LD50:103 mg/kg APTOA6 27,453,69
orl-man TDLo:571 ug/kg BLD KIZSB8 6(4),209,75
orl-mus LD50:184 mg/kg AIPTAK 202,79,73

THR: Causes BLD in man. HIGH orl.
Disaster Hazard: When heated to decomp it emits very tox fumes of HCl and NO_x.

ALPRENOLOL

CAS RN: 13655522 NIOSH #: UA 5350000
mf: $C_{15}H_{23}NO_2$; mw: 249.39

SYNS:
1-(O-ALLYLPHENOXY)-3-(ISOPROPYLAMINO)-2-PROPANOL
ALFEPROL (RUSSIAN)

TOXICITY DATA: 3 CODEN:
ivn-mus LD50:20 mg/kg ARZNAD 27,1022,77
orl-mam LD50:184 mg/kg PCJOAU 8,137,74
ipr-mam LD50:102 mg/kg PCJOAU 8,137,74

THR: HIGH ivn, orl, ipr.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

ALTERNARIOL-9-METHYL ETHER

CAS RN: 23452053 NIOSH #: HP 8755000
mf: $C_{15}H_{12}O_5$; mw: 272.27

SYNS:
ALTERNARIOL MONOMETHYL ETHER
3,7-DIHYDROXY-9-METHOXY-1-METHYL-6H-DIBENZO(B,D) PYRAN-6-ONE

TOXICITY DATA: 3 CODEN:
mmo-sat 500 ug/plate MUREAV 78,33,80
ipr-ham TDLo:200 mg/kg TOXID9 1,35,81

THR: MUT data. HIGH ipr. An exper TER.
Disaster Hazard: When heated to decomp it emits smoke and acrid fumes.

ALUMINON

CAS RN: 569584 NIOSH #: GU 4800000
mf: $C_{22}H_{23}N_3O_9$; mw: 473.48

SYNS:
AMMONIUM AURINTRICARBOXYLATE
AURINTRICARBOXYLIC ACID AMMONIUM SALT

TOXICITY DATA: 3 CODEN:
ivn-mus LD50:4 mg/kg 12VXA5 8,42,68

Reported in EPA TSCA Inventory, 1980.
THR: HIGH ivn.
Disaster Hazard: When heated to decomp it emits tox fumes such as NO_x.

ALUMINUM

CAS RN: 7429905 NIOSH #: BD 03300000
mf: Al; mw: 26.98

A silvery ductile metal. mp: 660°, bp: 2450°, d: 2.702, vap. press 1 mm @ 1284°. Sol in HCl, H_2SO_4 and alkalies.

SYNS:
ALAUN (GERMAN)
ALUMINA FIBRE
ALUMINIUM FLAKE
ALUMINUM DEHYDRATED
ALUMINUM, METALLIC, POWDER (DOT)
ALUMINUM POWDER
C.I. 77000

TOXICITY DATA: CODEN:
Toxicology Review: FOREAE 7,313,42; PEXTAR 12,102,69; AMTODM 3,209,77. DOT: Flammable Solid, Label: Flammable Solid FEREAC 41,57018,76. "NIOSH Manual of Analytical Methods" VOL 5 173#. Reported in EPA TSCA Inventory, 1980.
THR: Aluminum is not generally regarded as an industrial poison. Inhal of finely divided aluminum powder has been reported as a cause of pulmonary fibrosis. May be implicated in Alzheimers disease.
Fire Hazard of Dust: Mod, when exposed to heat or flame or by chemical reaction.
Spontaneous Heating: No.
Explosion Hazard of Dust: Mod, when exposed to heat or flame or on contact with powerful oxidizers such

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as chlorates, bromates, iodates, peroxides, perchlorates, nitrates, nitrites, oxides, performates, persulfates, halogens, NO_x, melted sulfates, SO_2, (trichloroethylene + HCl), (Na_2O_2 + CO_2), SCl_2, $COCl_2$, PCl_3, AgCl, O_2 compressed or liquid, (Pd + Δ), NOCl, (Nb oxide + S), chloro and/or fluoro methanes and ethanes, ICl, (Mn + air), CH_3Br, CH_3Cl, (fluoro-chloro lubricants + pressure), (Mg + $KClO_4$), propylene dichloride, Na_2C_2, Na_2CO_3, NaOH.

To Fight Fire: Special mixtures of dry chemical.

Incomp: Halocarbons, mercury (amalgam), Cl_2, I, (Fe + SiO_2 + Al), (Al foil + Hg), (Al + $BaNO_3$ + KNO_3 + S + organic matter) can explode.

For further information see Vol. 1, No. 4 of *DPIM Report.*

ALUMINUM AMMONIUM SULFATE

mf: $Al_2(SO_4)_3(NH_4)_2SO_4 \cdot 24H_2O$; mw: 906

Colorless crystals, odorless, sol in water, glycerine; insol in alc. d: 1.645; mp: 94.5°; bp: loses 20 H_2O @ 120°.

THR: A mild astringent used as a general-purpose food additive. Irr if inhal or ingested. See also aluminum compounds and sulfates.

Disaster Hazard: Dangerous; see sulfates.

ALUMINUM BOROHYDRIDE

mf: AlB_3H_{12}; mw: 71.53

Liquid. bp: 44.5°; mp: −64.5°; vap. press: 400 mm @ 28.1°.

SYN: ALUMINUM TETRAHYDROBORATE

THR: Unknown. See also hydrides and boron compounds.

Fire Hazard: Dangerous by spont chemical reaction; ignites spont in air, particularly in moist air.

Explosive Hazard: Explodes in O_2 at temperatures as low as 20°. An explosive range of 5% to 90%.

Incomp: Water, steam, oxidizing materials, acid or acid fumes.

Disaster Hazard: Mod dangerous; will react with water or steam to produce heat, H_2 or tox fumes.

To Fight Fire: CO_2, dry chemical.

ALUMINUM BROMIDE

CAS RN: 7727153 NIOSH #: BD 0350000
mf: $AlBr_3$; mw: 266.71

White to yellow-red lumps. mp: 97.5°; bp: 263.3° @ 748 mm; d: 3.2; vap. press: 1 mm @ 81.3°.

SYNS:
ALUMINUM BROMIDE (ANHYDROUS)
ALUMINUM TRIBROMIDE
TRIBROMOALUMINUM

TOXICITY DATA: CODEN:
DOT: Corrosive Material, Label: Corrosive FEREAC 41,57018,76.
Reported in EPA TSCA Inventory, 1980.

THR: A tox, corrosive material. See also bromides. Mixtures with Na or K explode violently upon impact.

Disaster Hazard: When heated to decomp it emits tox fumes of Br^-.

Incomp: Do not add H_2O to anhyd material. Hydrolysis can be violent.

ALUMINUM BROMIDE HYDROXIDE

CAS RN: 12794922 NIOSH #: BD 0360000

SYNS:
ALUMINUM BROMHYDROXIDE
ALUMINUM BROMOHYDROL
ALUMINUM HYDROXYBROMIDE

TOXICITY DATA: CODEN:
skn-hmn 90 mg/3D-I MLD 85DKA8 -,127,77

THR: A hmn skn irr. See also bromides.

Disaster Hazard: When heated to decomp it emits tox fumes of Br^-.

ALUMINUM CARBIDE

mf: Al_4C_3; mw: 143.91

Yellow crystal or powder, hygroscopic. mp: 2100°; bp: decomp @ 2200°; d: 2.36.

THR: Decomp by water. Incandesces in contact with $KMnO_4$ or PbO_2. Dust can cause pulmonary irr. See also aluminum compounds.

ALUMINUM CHLORATE

mf: $Al(ClO_3)_3$; mw: 277.4

Colorless, deliquescent crystals. mp: decomp.

THR: Unknown. See chlorates.

Fire Hazard: Mod, by spont chemical reaction; a powerful oxidizer; may ignite upon contact with combustibles.

Explosion Hazard: Mod, when shocked, exposed to heat or by spont chemical reaction with reducing agents. When contaminated, may become sensitized.

Disaster Hazard: Dangerous; shock or heat will explode it. See chlorides and chlorates.

Incomp: Evaporation, emits ClO_2.

ALUMINUM CHLORIDE

CAS RN: 7446700 NIOSH #: BD 0525000
mf: $AlCl_3$; mw: 133.33

White hex deliquescent crystals. d: 2.44; mp: 194° @ 5.2 atm; bp: subl @ 181°; vap. press: 1 mm @ 100.0°. Violently sol in water, sol in alc and ether.

SYNS:
ALLUMINIO(CLORURO DI) (ITALIAN)
ALUMINIUMCHLORID (GERMAN)
ALUMINUM CHLORIDE (1:3)
ALUMINUM TRICHLORIDE
CHLORURE D'ALUMINIUM (FRENCH)
TRICHLOROALUMINUM

TOXICITY DATA: 2
orl-mus TDLo:425 mg/kg (MGN)
orl-mus LD50:770 mg/kg
cyt-mus-ipr 100 mmol/L
orl-rat LD50:3700 mg/kg
orl-mus LD50:3805 mg/kg

CODEN:
BJIMAG 23,305,66
TJADAB 9,A14,74
NULSAK 15,180,72
12VXA5 8,43,68
BJIMAG 23,305,66

REF-15

ALUMINUM METHYL

mf: $Al(CH_3)_3$; mw: 72.07

Colorless liquid. bp: 130°; mp: 0°.

THR: Related alkyl aluminum compounds show strong irr properties and HIGH toxicity.
Fire Hazard: Dangerous, by spont chemical reaction with air.
Incomp: Water, halogenated hydrocarbons, and oxidizing materials.
Explosion Hazard: Mod by chemical reaction with air; explodes on contact with water.
Disaster Hazard: Dangerous; when heated to decomp it emits tox fumes; will explode on contact with moisture.
To Fight Fire: Do not use water, foam or halogenated extinguishing agents. Use dry chemical.

ALUMINUM (III) NITRATE (1:3)

CAS RN: 13473900 NIOSH #: BD 1040000
mf: $N_3O_9 \cdot Al$; mw: 213.01

White crystals

SYNS:
ALUMINUM NITRATE (DOT)
ALUMINUM TRINITRATE
NITRIC ACID, ALUMIUM SALT
NITRIC ACID, ALUMINUM(3+) SALT

TOXICITY DATA: CODEN:
DOT: Oxidizer, Label: Oxidizer FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980.
THR: See nitrates and aluminum compounds. A powerful oxidizer.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

ALUMINUM NITRIDE

mf: AlN; mw: 41

White or colorless crystals. mp: 2200°; bp: sublimes @ 2000°; d: 3.26.

THR: See nitrides and ammonia and aluminum compounds.
Disaster Hazard: Mod; will react with water or steam to produce tox or corrosive fumes.
Incomp: Water or steam.

ALUMINUM OXIDE (2:3)

CAS RN: 1344281 NIOSH #: BD 1200000
mf: Al_2O_3; mw: 101.96

White powder; mp: 2050°; bp: 2977°, d: 3.5-4.0; vap press: 1 mm @ 2158°.

SYNS:
ACTIVATED ALUMINUM OXIDE
ALUMINA
ALPHA-ALUMINA
GAMMA-ALUMINA
BETA-ALUMINA
ALUMINIUM OXIDE
ALUMINUM OXIDE
ALPHA-ALUMINUM OXIDE
BETA-ALUMINUM OXIDE
GAMMA-ALUMINUM OXIDE
ALUMINUM SESQUIOXIDE

TOXICITY DATA: 3 CODEN:
ipl-rat TDLo:90 mg/kg:ETA BJCAAI 28,173,73

TLV: Air: 10 mg/m3 DTLVS* 4,14,80. *Toxicology Review:* 31BYAP -,94,74. Reported in EPA TSCA Inventory, 1980.
THR: There has been some record of lung damage due to the inhal of finely divided aluminum oxide particles. However, this effect (known as Shaver's disease) is complicated by the presence in the inhaled air of silica and oxides of iron. A nuisance particulate. An exper ETA via ipl. See also aluminum compounds.
Incomp: Hot chlorinated rubber. For further information see Alumina, Vol. 1, No. 5 of *DPIM Report.*

ALUMINUM PHENOXIDE

mf: $Al(C_6H_5O)_3$; mw: 306.3

Gray-white powder or crystalline mass. mp: 265° (decomp); d: 1.23.

THR: MOD irr to skin, eyes and mu mem via oral and inhal routes.
Disaster Hazard: Dangerous; see phenol.

ALUMINUM PHOSPHIDE

CAS RN: 20859738 NIOSH #: BD 1400000
mf: AlP; mw: 57.95

Dark gray or dark yellow crystals. d: 2.85 @ 25°/4°. mp: >1000°.

SYNS:
ALUMINIUM FOSFIDE (DUTCH)
ALUMINUM MONOPHOSPHIDE
ALUMINIUM PHOSPHIDE
ALUMINUM PHOSPHIDE (DOT)
FOSFURI DI ALLUMINIO (ITALIAN)
PHOSPHURES D'ALUMIUM (FRENCH)

TOXICITY DATA: 3 CODEN:
orl-hmn LD50:20 mg/kg 85ARAE 3,38,76
ihl-mam LCLo:1 ppm PCOC** -,25,66

Aquatic Toxicity Rating: TLm96:10-1 ppm WQCHM* 2,-,74. DOT: Flammable Solid, Label: Flammable Solid and Dangerous When Wet FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980.
THR: HIGH hmn orl. HIGH mam ihl. An insecticide and a fumigant; releases phosphine. See phosphine. A poison. HIGH via oral and inhal routes. A food additive permitted in the food and drinking water of animals and/or for the treatment of food-producing animals.
Disaster Hazard: Dangerous; in contact with water or steam it yields PH_3, which is spont flammable in air. See phosphine. When heated to decomp it yields PO_x.

ALUMINUM PICRATE

mf: $Al(C_6H_2O(NO_2)_3)_3$; mw: 711.3

A solid.

THR: A powerful allergen. A poison. See also picric acid.
Fire Hazard: Dangerous, by chemical reaction with reducing materials; a powerful oxidizer.

Very light, odorless, white powder, sol in acids; insol in water and alc. d: 3.04; decomp @ 350°.

SYNS:

CARBONATE MAGNESIUM
CARBONIC ACID, MAGNESIUM SALT
C.I. 77713
HYDROMAGNESITE
MAGMASTER
MAGNESITE

TOXICITY DATA: CODEN:

Aquatic Toxicity Rating: TLm96:over 1000 ppm WQCHM* 3,-,74. Reported in EPA TSCA Inventory, 1980.

THR: No data. A general-purpose food additive; it migrates to food from packaging materials. See also magnesium.

Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

MAGNESIUM CARBONATE

mf: $MgCO_3$; mw: 84.32

Very light, odorless, white powder, sol in acids; insol in H_2O and alc. d: 3.04, decomp @ 350°.

SYNS:

MAGNESIUM CARBONATE, PRECIPITATED
MAGNESIA ALBA

THR: Probably LOW. A general-purpose food additive; it migrates to food from packaging materials.

Incomp: Formaldehyde.

MAGNESIUM CHLORATE

CAS RN: 10326213 NIOSH #: FO 0175000
mf: $Cl_2O_6 \cdot Mg$; mw: 191.21

White deliquescent crystals or powder. Bitter taste; mp: 35°, bp: decomp @ 120°, d: 1.80 @ 25°. Slightly sol in alc. Keep well closed.

SYN: CHLORATE SALT OF MAGNESIUM

TOXICITY DATA: 2-1 CODEN:

orl-rat LDLo:5250 mg/kg JPETAB 35,1,29
ipr-rat LDLo:1100 mg/kg JPETAB 35,1,29

Toxicology Review: 27ZTAP 3,33,69. Reported in EPA TSCA Inventory, 1980.

THR: MOD ipr; LOW orl. A defoliant. See magnesium compounds and chlorates.

Incomp: Al, Sb_2S_3, As, As_2S_3, C, charcoal, Cu, CuS, MnO_2, metal sulfides, dibasic organic acids, organic matter, P, SnS_2, SnS, S.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

MAGNESIUM CHLORIDE

CAS RN: 7786303 NIOSH #: OM 2800000
mf: Cl_2Mg; mw: 95.21

mp: 712° (rapid heating). Thin white to opaque gray granules and/or flakes. mp: 708°; bp: 1412°; d: 2.325. Sol in H_2O evolving much heat.

TOXICITY DATA: 3-2 CODEN:

mmo-omi 8000 ppm APMBAY 6,45,58
cyt-hmn:hla 2 mmol/L JCLLAX 78,217,71
orl-rat LD50:2800 mg/kg JPETAB 35,1,29
ipr-rat LDLo:225 mg/kg JPETAB 35,1,29
scu-rat LDLo:900 mg/kg ENDOAO 24,523,39
ipr-mus LD50:99 mg/kg COREAF 256,1043,63
ivn-mus LD50:14 mg/kg TXAPA9 22,150,72

Toxicology Review: 27ZTAP 3,88,69. Reported in EPA TSCA Inventory, 1980.

THR: MUT data. HIGH ivn, ipr; MOD orl, scu. A substance which migrates to food from packaging materials. See also magnesium.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

MAGNESIUM CHLORIDE HEXAHYDRATE

CAS RN: 7791186 NIOSH #: OM 2975000
mf: $Cl_2Mg \cdot 6H_2O$; mw: 203.33

Deliquesc crystals; d: 1.59; mp: when rapidly heated approx 118° with decomp. Keep well closed.

TOXICITY DATA: 3-1 CODEN:

orl-rat LD50:8100 mg/kg AIHAAP 30,470,69
ivn-rat LDLo:176 mg/kg JLCMAK 15,35,29

THR: HIGH ivn; LOW orl. See also magnesium.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

MAGNESIUM COMPOUNDS

THR: The inhal of fumes of freshly sublimed magnesium oxide may cause metal fume fever. There is no evidence that magnesium produces true systemic poisoning. Occupational health hazards may exist in magnesium foundries, probably from the presence of atmospheric contaminants such as fluorides, sulfur dioxide, carbon tetrachloride and chromium compounds.

Particles of metallic magnesium or magnesium alloy which perforate the skin or gain entry through cuts and scratches may produce a severe local lesion characterized by the evolution of gas and acute inflammatory reaction, frequently with necrosis. The condition has been called a "chemical gas gangrene." Gaseous blebs may develop within 24 hrs of the injury. The inflammatory response is marked at the site of injury and there may be signs of lymphangitis. The lesion is very slow to heal.

The most serious hazard presented by magnesium is the danger from burns. Protection necessary for personnel handling and processing magnesium is usually no different from that which is necessary for other metals. It is recommended that smooth clothing and leather or fire resistant, easily removable aprons be worn in grinding operations on magnesium. The toxicity of magnesium compounds is usually that of the anion. Refer to magnesium and anion. See also specific compounds.

MAGNESIUM DROSS, (HOT)

CAS RN: 69011638 NIOSH #: OM 3200000

THR: LOW ihl. Easily ignited in air. Violent reaction with Cl_2. Silanes are MOD irr to skn, eyes, mu mem. Reacts with oxidizers.
Disaster Hazard: When heated to decomp it burns or explodes. It self-explodes.
Incomp: Covalent halides, halogens.

SILASTIC 386 CATALYST

NIOSH #: VV 7265000

TOXICITY DATA:	2-1	CODEN:
skn-rbt 500 mg/24H MLD		NTIS** LA-7367-MS
eye-rbt 100 mg/1H SEV		NTIS** LA-7367-MS
orl-rat LD50:4350 mg/kg		NTIS** LA-7367-MS
orl-mus LD50:2125 mg/kg		NTIS** LA-7367-MS

THR: MOD-LOW orl. A skn, eye irr.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

SILICA, AMORPHOUS FUMED

CAS RN: 7631869 NIOSH #: VV 7310000
mf: O_2Si; mw: 60.09

A finely powdered microcellular silica foam with minimum SiO_2 content of 89.5%.

SYNS:

SILICA, AMORPHOUS	FOSSIL FLOUR
AMORPHOUS SILICA DUST	FUMED SILICA
COLLOIDAL SILICA	FUMED SILICON DIOXIDE
COLLOIDAL SILICON DIOXIDE	SILICIC ANHYDRIDE
ENT 25,550	

TOXICITY DATA:	3-2	CODEN:
orl-rat LD50:3160 mg/kg		ARSIM* 20,9,66
ipr-rat LDLo:50 mg/kg		AHBAAM 136,1,52
ivn-rat LD50:15 mg/kg		BSIBAC 44,1685,68
itr-rat LDLo:10 mg/kg		AHBAAM 136,1,52

TLV: Air: 6 mg/m3 DTLVS* 4,362,80. *Toxicology Review:* NTIS** CONF-691001. OSHA Standard: Air: TWA 80 mg/m3/%SiO2 (SCP-R) FEREAC 39, 23540,74. Reported in EPA TSCA Inventory, 1980.
THR: MOD ipr, ivn, itr, orl. A general-purpose food additive. See also silica. Much less tox than crystalline forms. Does not cause silicosis.

SILICA, AMORPHOUS FUSED

CAS RN: 60676860 NIOSH #: VV 7320000
mf: O_2Si; mw: 60.09

Made up of spherical submicroscopic particles under 0.1 μ in size (AMIHBC 9,389,54)

SYNS:

AMORPHOUS FUSED SILICA	SILICA, VITREOUS
FUSED QUARTZ	SILICON DIOXIDE
FUSED SILICA	VITREOUS QUARTZ
QUARTZ GLASS	

TOXICITY DATA:	3	CODEN:
ipr-rat LDLo:400 mg/kg		AMIHBC 9,389,54
itr-rat LDLo:120 mg/kg		AMIHBC 9,389,54
ipr-mus LDLo:40 mg/kg		BJEPA5 3,75,22
ivn-cat LDLo:15 mg/kg		JLCMAK 26,774,41
ivn-rbt LDLo:35 mg/kg		BJEPA5 3,75,22
ipr-gpg LDLo:120 mg/kg		BJEPA5 3,75,22

TLV: Air: 10 mg/m3 DTLVS* 4,363,80. OSHA Standard: Air: TWA 80 mg/m3/%SiO2 (SCP-R) FEREAC 39,23540,74. Reported in EPA TSCA Inventory, 1980.
THR: HIGH ipr, itr, ivn. See also silica.

SILICA, AMORPHOUS HYDRATED

CAS RN: 763 18 69 NIOSH #: VV 7322000
mf: O_2Si; mw: 60.09

SYNS:

SILICA AEROGEL	SILICA GEL
SILICA XEROGEL	SILICIC ACID

TOXICITY DATA:
OSHA Standard: Air: TWA 80 mg/M^3/%SiO_2 FEREAC 39,23540,74.
THR: The pure unaltered form is considered nontoxic. Some deposits contain small amounts of crystalline quartz which is therefore fibrogenic. When diatomaceous earth is calcined (with or without fluxing agents) some silica is converted to cristobalite and is therefore fibrogenic. Tridymite has never been detected in calcined diatomaceous earth. See also silica.

SILICA (CRYSTALLINE)

mf: SiO_2; mw: 60.09

mp: 1710°; bp: 2230°; d (amorphous): 2.2; d (crystalline): 2.6; vap press: 10 mm @ 1732°.

SYNS:

AGATE	PURE QUARTZ
AMETHYST	ROSE QUARTZ
CHALCEDONY	SAND
CHERTS	SILICON DIOXIDE
FLINT	TRIDYMITE
GLASS	SILICA FLOUR
ONYX	CRISTOBALITE

THR: MOD as an acute irr dust. From the point of view of numbers of men exposed and cases of disability produced, silica is the chief cause of pulmonary dust disease. The prolonged inhal of dusts containing free silica may result in the development of a disabling pulmonary fibrosis known as silicosis. The Committee on Pneumoconiosis of the American Public Health Association defines silicosis as "a disease due to the breathing of air containing silica (SiO_2), characterized by generalized fibrotic changes and the development of miliary nodules in both lungs, and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis (some or all of which symptoms may be present), and characteristic x-ray findings."

Silica occurs in the pure state in nature as highly fibrogenic quartz. It is the main constituent of relatively much less toxic sand, sandstone, tripoli and diatomaceous earth. It is present in crystalline form in high amounts (up to 35%) in granite. Exposure to silica occurs in hard rock mining, in foundries, in manufac-

REF-15

ture of porcelain and pottery, in the spraying of vitreous enamels, in sandblasting, in granite-cutting and tombstone-making, in the manufacture of silica firebrick and other refractories, in grinding and polishing operations where natural abrasive wheels are used and other occupations.

The duration of exposure which is associated with the development of silicosis varies widely for different occupations. Thus, the average duration of exposure required for the development of silicosis in sand-blasters is 2-10 yrs, in moulders and granite cutters, about 30 yrs, and in hard rock miners 10-15 yrs. There is also much variation in individual susceptibility, certain workers showing radiological evidence of the disease years before their fellow workmen who are similarly exposed. Such susceptible individuals are fortunately rather rare.

The action of crystalline silica on the lungs results in the production of a diffuse, nodular fibrosis in which the parenchyma and the lymphatic system are involved. This fibrosis is, to a certain extent, progressive, and may continue to increase for several yrs after exposure is terminated. Where the pulmonary reserve is sufficiently reduced, the worker complains of shortness of breath on exertion. This is the first and most common symptom in cases of uncomplicated silicosis. If severe, it may incapacitate the worker for heavy, or even light, physical exertion, and in extreme cases there may be shortness of breath even while at rest. The most common physical sign of silicosis is a limitation of expansion of the chest. There may be a dry cough, sometimes very troublesome. The characteristic radiographic appearance is one of diffuse, discrete nodulation, scattered throughout both lung fields. Where the disease advances, the shortness of breath becomes worse, and the cough more productive and troublesome. There is no fever or other evidence of systemic reaction. Further progress of the disease results in marked fatigue, extreme dyspnea and cyanosis, loss of appetite, pleuritic pain and total incapacity to work. If tuberculosis does not supervene, the condition may eventually cause death either from cardiac failure or from destruction of lung tissue, with resultant anoxemia. In the later stages, the x-ray may show large conglomerate shadows, due to the coalescence of the silicotic nodules, with areas of emphysema between them.

Silica in some forms is used as a food additive permitted in the feed and drinking water of animals and/or for the treatment of food-producing animals. It is also permitted in food for human consumption. It is a common air contaminant. Reacts violently with ClF_3, MnF_3, OF_2.

SILICA, CRYSTALLINE-CRISTOBALITE

CAS RN: 14464461 NIOSH #: VV 7325000
mf: O_2Si; mw: 60.09

White cubic-system crystals formed from QUARTZ at temperatures above 1470°C (NTIS** PB246-697)

SYNS:

CALCINED DIATOMITE
CRISTOBALITE

TOXICITY DATA: 3	CODEN:
ipl-rat TDLo:90 mg/kg TFX:CARC	JNCIAM 57,509,76
ipl-rat TD:100 mg/kg TFX:ETA	BJCAAI 41,908,80
ihl-hmn TCLo:400 particles/cc/4Y-I TFX:PUL	BJIMAG 5,148,48
ihl-hmn TCLo:16 mppcf/8H/17.9Y-I TFX:PUL	NTIS** PB246-697
itr-rat LDLo:200 mg/kg	BJIMAG 10,9,53

Toxicology Review: ANAEA3 35,165,75; 31BYAP -,93,74. OSHA Standard: Air: TWA 5 mg/m3/(%SiO2+2) (Respirable) (SCP-S) FEREAC 40, 27073,75. Occupational Exposure to Crystalline Silica recm std: Air: TWA 50 ug/m3 NTIS**. "NIOSH Manual of Analytical Methods" VOL 1 109, VOL 3 S315, VOL 5 259#. Reported in EPA TSCA Inventory, 1980.

THR: An exper CARC, ETA. A hmn PUL. HIGH itr. See also silica, but about twice as toxic in causing silicosis.

SILICA, CRYSTALLINE-QUARTZ

CAS RN: 14808607 NIOSH #: VV 7330000
mf: O_2Si; mw: 60.09

SYNS:

AGATE
AMETHYST
CHALCEDONY
CHERTS
FIBERGLASS
FIBROUS GLASS
FLINT
GLASS
ONYX
PURE QUARTZ
QUARTZ
QUAZO PURO (ITALIAN)
ROSE QUARTZ
SAND
SILICA FLOUR (POWDERED CRYSTALLINE SILICA)
SILICIC ANHYDRIDE

TOXICITY DATA: 3	CODEN:
itr-rat TDLo:100 mg/kg/19W-I TFX:ETA	EVHPAZ 34,47,80
ipl-rat TD:100 mg/kg TFX:ETA	AIHAAP 41,836,80
ipr-rat TDLo:45 mg/kg TFX:CAR	ZHPMAT 162,467,76
ivn-rat TDLo:90 mg/kg TFX:ETA	JNCIAM 57,509,76
ipl-rat TDLo:90 mg/kg TFX:CAR	JNCIAM 57,509,76
imp-rat TDLo:900 mg/kg TFX:NEO	AICCA6 10,119,54
imp-mus TDLo:4000 mg/kg TFX:ETA	BJCAAI 22,825,68
ipl-ham TDLo:83 mg/kg TFX:NEO	31BYAP -,97,74
ipr-rat TD:90 mg/kg/4W-I TFX:ETA	JNCIAM 57,509,76
ipr-rat TD:450 mg/kg/4W-I TFX:NEO	NATWAY 59,318,72
imp-rat TD:4554 mg/kg TFX:ETA	CORIBR 88,223,72
ipl-rat TD:200 mg/kg TFX:ETA	JNCIAM 48,797,72
ipl-rat TD:100 mg/kg TFX:CAR	BJCAAI 41,908,80
ihl-hmn TCLo:16 mppcf/8H/17.9Y-I TFX:PUL	NTIS** PB246-697
ihl-hmn LCLo:300 ug/m3/10Y-I	ANYAA9 271,324,76
ivn-rat LDLo:90 mg/kg	JNCIAM 57,509,76
itr-rat LDLo:200 mg/kg	BJIMAG 10,9,53
ivn-mus LDLo:40 mg/kg	JNCIAM 1,241,40
ivn-dog LDLo:20 mg/kg	BIJOAK 27,1007,33

Aquatic Toxicity Rating: TLm96:over 1000 ppm WQCHM* 4,-,74

TLV: Air: 10 mg/m3 DTLVS* 4,364,80. *Toxicology Review:* 31BYAP -,94,74. OSHA Standard: Air: TWA 10 mg/m3/%SiO2+2 (Respirable) (SCP-S) FEREAC

SYNS:
TETRACHLORURE DE TITANE (FRENCH)
TITAANTETRACHLORIDE (DUTCH)
TITANIO (TETRACLORURO DI) (ITALIAN)
TITANIUM TETRACHLORIDE
TITANTETRACHLORID (GERMAN)

TOXICITY DATA: 3
ihl-rat LC50:460 mg/m3/4H
ihl-mus LCLo:10 mg/m3/2H

CODEN:
TOXID9 1,76,81
NTIS** AEC-TR-6710

Aquatic Toxicity Rating: TLm96:1000-100 ppm WQCHM* 4,-,74. DOT: Corrosive Material, Label: Corrosive FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: HIGH ihl. See also titanium compounds. HIGH irr to skin, eyes and mu mem and via inhal route. HIGH corrosive because it liberates heat and hydrochloric acid upon contact with moisture. If spilled on skin, wipe off with dry cloth before applying water. Reacts violently with K, HF.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^- and HCl.

TITANIUM COMPOUNDS

THR: This material is considered to be physiologically inert. There are no reported cases in the literature where titanium as such has caused intoxication. The dusts of titanium or titanium compounds such as titanium oxide may be placed in the nuisance category. Titanium tetrachloride, however, is an irr and corrosive material, because when exposed to moisture, it hydrolyzes to hydrogen chloride. See also hydrochloric acid, and titanium.

TITANIUM DICHLORIDE

mf: Cl_2Ti; mw: 118.81

Black crystals. mp: 1035°; d: 3.13 Decomp by water. Sol in alc; almost insol in chloroform, ether, carbon disulfide.

THR: No tox data. See also titanium compounds, HCL. Ignites in air.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

TITANIUM OXIDE

as discussed in (DTLVS)

CAS RN: 13463677 NIOSH #: XR 2275000
mf: O_2Ti; mw: 79.90

Blue crystals. mp: 1860° (decomp), d: 4.26.

SYNS:
C.I. 77891
C.I. PIGMENT WHITE 6
NCI-C04240
TITANDIOXID (SWEDEN)
TITANIUM DIOXIDE
RUTILE
TRIOXIDE(S)
ATLAS WHITE TITANIUM DIOXIDE

TOXICITY DATA: 3
skn-hmn 300 ug/3D-I MLD
ims-rat TDLo:360 mg/kg/2Y-I TFX:NEO
ims-rat TD:260 mg/kg/84W-I TFX:ETA

CODEN:
85DKA8 -,127,77
NCIUS* PH 43-64-886,JUL,68
NCIUS* PH 43-64-886,AUG,69

Aquatic Toxicity Rating: TLm96:over 1000 ppm WQCHM* 4,-,74.

TLV: Air: 10 mg/m3 DTLVS* 4,399,80. OSHA Standard: Air: TWA 15 mg/m3 (SCP-O) FEREAC 39, 23540,74. NCI Carcinogenesis Bioassay Completed; Results Negative (NCITR* NCI-CG-TR-97,79). "NIOSH Manual of Analytical Methods" VOL 3 S385. Reported in EPA TSCA Inventory, 1980.

THR: A hmn skn irr. An exper NEO, ETA. See also titanium compounds. A common air contaminant and nuisance dust. Violent reaction with Li and other metals.

For further information see Vol. 3, No. 1 of *DPIM Report.*

TITANIUM SULFATE (SOLUTION)

CAS RN: 13825746 NIOSH #: XR 2500000

TOXICITY DATA: CODEN:
DOT: Corrosive Material, Label: Corrosive FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: No data. See also titanium compounds and sulfates.

Disaster Hazard: When heated to decomp it emits tox fumes of SO_x.

TITANOCENE

CAS RN: 1271290 NIOSH #: XR 2075000
mf: $C_{10}H_{10}Ti$; mw: 178.10

SYN: DI-PI-CYCLOPENTADIENYLTITANIUM

TOXICITY DATA: 3
ims-rat LDLo:50 mg/kg
ims-ham LDLo:83 mg/kg

CODEN:
NCIUS* PH-43-64-886
NCIUS* PH-43-64-886

THR: HIGH ims. See also titanium compounds.

Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

TOBACCO LEAF ABSOLUTE

CAS RN: 8037192 NIOSH #: XR 7355000

An extract of the cured leaves of nicotiana affinis with petroleum or benzene and then with alcohol (FCTXAV 16,637,78)

SYN: BURLEY TOBACCO

TOXICITY DATA: 3
skn-gpg 500 mg/24H MLD
skn-mus TDLo:31 gm/kg/40W-I:ETA

CODEN:
FCTXAV 16,637,78
CNREA8 28,2363,68

Reported in EPA TSCA Inventory, 1980.

THR: An exper ETA. A skn irr. See Tobacco Leaf, Nicotiana Glauca.

THR: A hmn skn irr. See also zirconium compounds and chlorides.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

ZIRCONIUM CHLORIDE OXIDE OCTAHYDRATE

CAS RN: 13520928 NIOSH #: ZH 7250000
mf: $Cl_2OZr \cdot 8H_2O$; mw: 322.28

SYN: ZIRCONYL CHLORIDE OCTAHYDRATE

TOXICITY DATA: 3 CODEN:
idr-mus TDLo:800 ug/kg:ETA CNREA8 33,287,73

THR: An exper ETA. See also zirconium compounds and chlorides.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

ZIRCONIUM COMPOUNDS

THR: Zirconium is not an important industrial poison. Deaths in rbts have been caused by intravenous injection of 150 mg/kg of body weight. Most zirconium compounds in common use are insol and considered inert. Pulmonary granuloma in zirconium workers has been reported and sodium zirconium lactate has been held responsible for skn granulomas. Avoid inhal of Zr-containing aerosols, which can cause lung granulomas. Zr-containing drugs or cosmetic products are being controlled by the FDA.

ZIRCONIUM DICHLORIDE

mf: Cl_2Zr; mw: 162.13

THR: No tox data. See also zirconium compounds; chlorides. If warm it ignites in air.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

ZIRCONIUM FLUORIDE

CAS RN: 7783644 NIOSH #: ZH 7875000
mf: F_4Zr; mw: 167.22

Refractive crystals, water-sol. d: 4.6 @ 16°, sublimes @ 600°. Very sol in HF.

SYN: ZIRCONIUM TETRAFLUORIDE

TOXICITY DATA: 3 CODEN:
ivn-mus LD50:98 mg/kg 19UQAS -,30,65

OSHA Standard: Air: TWA 2500 ug(F)/m3 (SCP-W) FEREAC 39,23540,74. Occupational Exposure to Inorganic Fluorides recm std: Air: TWA 2.5 mg(F)/m3 NTIS**. Reported in EPA TSCA Inventory, 1980.
THR: HIGH ivn. See also zirconium compounds and fluorides.
Disaster Hazard: When heated to decomp it emits tox fumes of F^-.

ZIRCONIUM HYDRIDE

CAS RN: 7704996 NIOSH #: ZH 8015000
mf: H_2Zr; mw: 93.24

Metallic dark gray to black powder. d: 5.6; autoign. temp: 270° (in air).

TOXICITY DATA:
DOT: Flammable Solid, Label: Flammable Solid and Dangerous When Wet FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980.
THR: No data. See also hydrides and zirconium compounds. Incandesces when heated in air. Flammable when wet. Very dangerous to handle; can explode.
Disaster Hazard: Very flammable.

ZIRCONIUM (III) LACTATE (1:3)

CAS RN: 63919142 NIOSH #: ZH 8050000
mf: $C_9H_9O_9 \cdot H_4OZr$; mw: 372.44

SYN: LACTIC ACID, ZIRCONIUM SALT (3:1)

TOXICITY DATA: 2 CODEN:
skn-mus TDLo:20 ug/kg:SKN JAMAAP 190,940,64
ipr-rat LD50:670 mg/kg AIHAAP 24,131,63

THR: An exper SKN. MOD ipr. See also zirconium compounds.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

ZIRCONIUM (IV) LACTATE

CAS RN: 60676-90-6 NIOSH #: ZH 8575000
mf: $Zr \cdot C_3H_5O_3$; mw: 180.3

White, slightly moist pulp, very slightly sol in water and common organic solvents; sol in aqueous alkali solns with the formation of salts.

SYN: LACTIC ACID, ZIRCONIUM SALT (4:1)

TOXICITY DATA: CODEN:
idr-man TDLo:170 ug/kg/I:ALR JIDEAE 38,223,62

"NIOSH Manual of analytical Methods" VOL 3 S185 VOL. 7 351 NIMAM*. Meets criteria for proposed OSHA Medical Records Rule FEREAC 47,30420,82.
THR: HIGH idr. Prolonged ihl of dust has caused granulomas, interstitial pneumonia. A powerful skn allergen. See also zirconium compounds.

ZIRCONIUM NITRATE

CAS RN: 13746899 NIOSH #: ZH 8750000
mf: $N_4O_{12} \cdot Zr$; mw: 339.26

White crystals.

SYN: DUSICNAN ZIRKONICITY (CZECH)

TOXICITY DATA: 2 CODEN:
orl-rat LD50:2290 mg/kg MarJV# 29MAR77
ihl-rat LCLo:500 mg/m3/30M NTIS** AEC-TR-6710

OSHA Standard: Air: TWA 5 mg(Zr)/m3 (SCP-W) FEREAC 39,23540,74. Reported in EPA TSCA Inventory, 1980.

US CENSUS DATA, 1980

US Census Data used in the HRS scoring was obtained from various County Planning Offices. This data was not obtained from a report. The raw census data combined with County Planning Maps was used to estimate the population within 1, 2, 3, and 4 miles of the Phase I site being investigated. Because of the voluminous amount of data used, the data is not provided in this Appendix.

United States
Environmental Protection
Agency

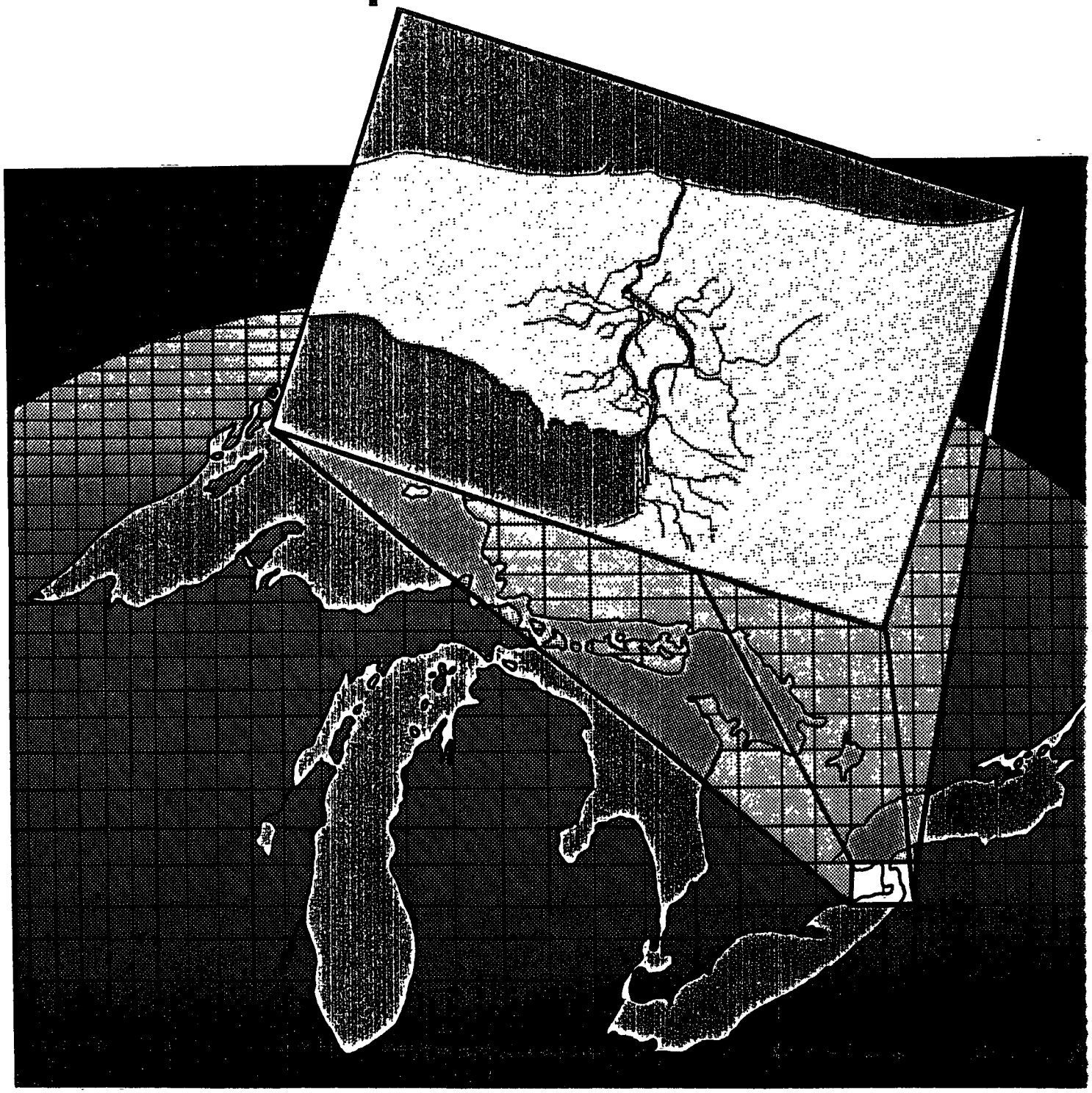
Great Lakes National
Program Office
536 South Clark Street
Chicago, Illinois 60605

March 1985

REF-17

EPA

Preliminary Evaluation Of Chemical Migration To Groundwater and The Niagara River from Selected Waste-Disposal Sites



REF ,7

"Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste-Disposal Sites"

By

Edward J. Koszalka, James E. Paschal, Jr.,

Todd S. Miller and Philip B. Duran

Prepared by the U.S. Geological Survey

in cooperation with the

New York State Department of Environmental Conservation

for the

U.S. ENVIRONMENTAL PROTECTION AGENCY

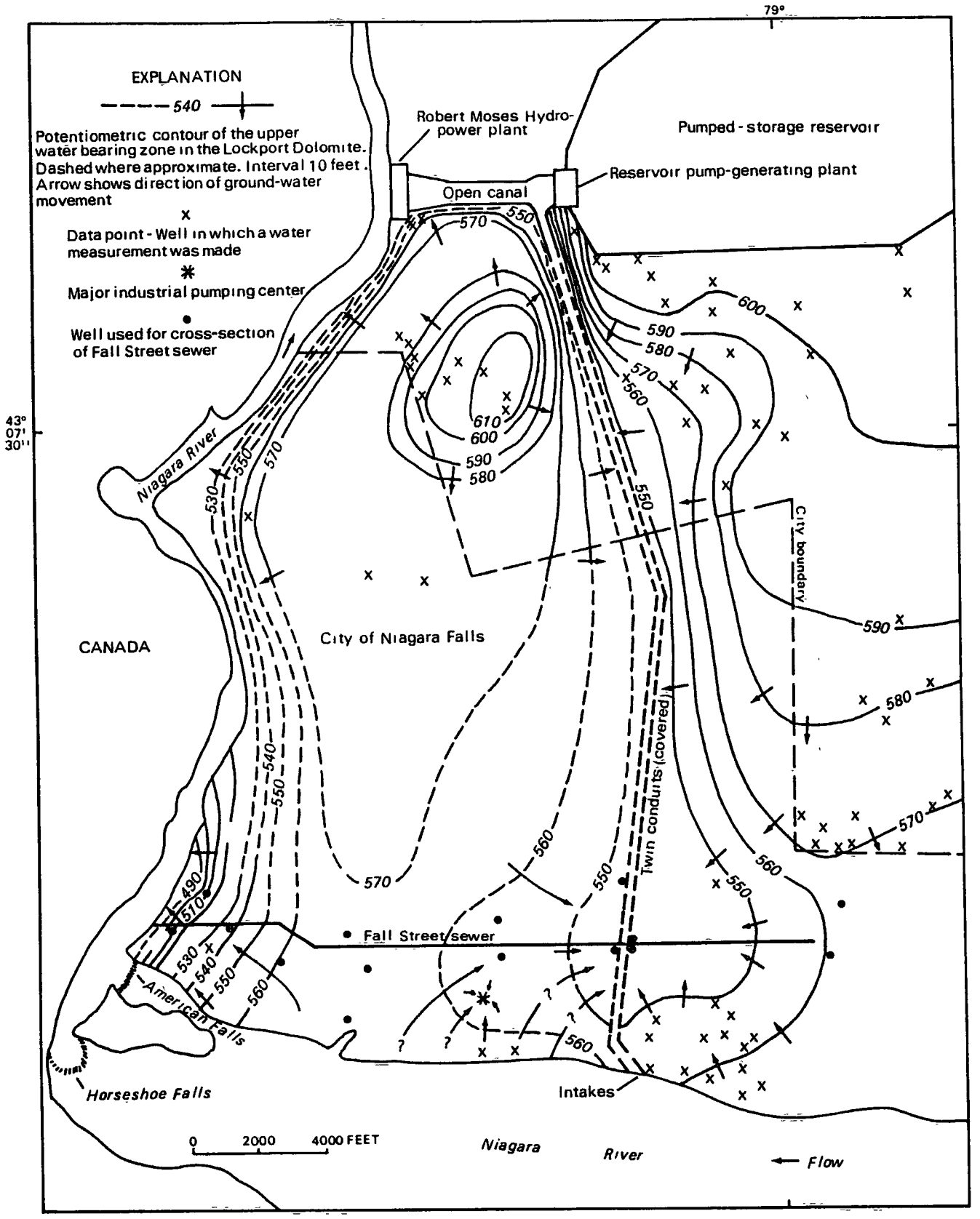


Figure 8. Potentiometric surface of the upper water-bearing zones of the Lockport Dolomite and location of bedrock wells in the Niagara Falls area.

Table. C-9.--Chemical data from well 77A in the southwest part of site 38 (continued)

	Concentration (µg/L)	
Priority pollutants (continued)	Maximum	Mean
Trichloroethylene	157	79
1,1,2-Trichloroethane	11	6
2-Chlorophenol	Trace	Trace
4-Chlorophenol	Trace	Trace
Phenol	3	3
2,4-Dichlorophenol	507	507
2,4,6-Trichlorophenol	734	734
1,4-Dichlorobenzene	190	190
1,2-Dichlorobenzene	130	130
1,2,4-Trichlorobenzene	Trace	Trace
1,3,5-Trichlorobenzene	Trace	Trace
Naphthalene	Trace	Trace
α-BHC	5	5
δ-BHC	17	17
Nonpriority pollutants		
Diethyl phthalate	Trace	Trace
3-Chlorotoluene	500	500
4-Chlorotoluene	500	328
m-Xylene	2	2
p and o-Xylene	1	1
4-Chlorophenol	Trace	Trace
2,4,6-Trichloroaniline	Trace	Trace
1,2,3,4-Tetrachlorobenzene	Trace	Trace
2-Chlorotoluene	304	152

39. OCCIDENTAL, HYDE PARK LANDFILL (Literature review) NYSDEC 932021

General information and chemical-migration potential.--The Occidental Hyde Park landfill, a 15-acre site in the northwest corner of the town of Niagara, was active during 1953-75 and was used for disposal of 80,000 tons of chemical wastes related to production of fertilizers, plastics, and various industrial products. Typical wastes deposited are listed in table C-10. The landfill was clay capped, and a leachate-collection system was installed in 1979.

Chemical analyses of ground water from several wells suggest some migration of leachate away from the burial area, but the lateral and vertical extent of contaminant movement is not known. The log of one well describes a slurry of mixed chemicals as deep as 26 ft below the top of the fill. Contaminants have also been detected in ground water from 50 ft below the top of the Lockport Dolomite, and nonaqueous chemicals have been found at this depth at a distance of 700 ft from the site. Recent chemical data indicate that contaminants have migrated through the full thickness of the Lockport Dolomite. Well locations are shown in figure C-14.

Contaminants in the upper unconsolidated deposits (lake deposits and till) move slowly because the permeability of these deposits is low. The leachate-collection system and clay cap would help deter horizontal contaminant movement, but some contaminants could move vertically downward and enter the more permeable Lockport Dolomite. Johnston (1982) estimated that ground water in the Lockport Dolomite in the area would take 4.9 years to reach the Niagara River gorge, 3,000 ft to the northwest. Leachate may not move at the same rate as uncontaminated ground water, however, and more data would be needed on the flow regime of both the Lockport Dolomite and the underlying Rochester Shale to determine the vertical and horizontal flow components. Water levels in wells completed in the unconsolidated deposits and in bedrock near the landfill indicate gradients to be west-northwest toward the Niagara River gorge. The site has a major potential for contaminant migration.

The site is undergoing an intensive investigation by Occidental Chemical Corporation that is being conducted under the terms of a negotiated settlement agreement that was approved by Federal Court. As of 1983, 47 bedrock wells and 13 overburden wells have been installed along lines radiating outward from the site. Chemical and hydrogeologic data from this investigation are available from the New York State Department of Environmental Conservation, in Buffalo, N.Y. These data indicate that contamination from the site extends to the top of the Rochester Shale, that aqueous-phase migration has been detected east, northwest, and southwest of the site, and that nonaqueous-phase migration has been detected southwest of the site.

Geologic information.--Glacial deposits 10 to 35 ft thick and consisting of till and lacustrine clay, silt, and fine sand overlie the Lockport Dolomite. Pebbles occur sporadically in lake sediments, which might indicate this deposit to be a till (reworked lake deposit).

The Lockport Dolomite in this area ranges from 90 to 130 ft in thickness. Depth to bedrock is generally less than 15 ft east of the landfill, and increases to about 35 ft west of the landfill. The upper 10 to 15 ft is the most permeable zone (Johnston, 1982). Underlying the Lockport Dolomite is the Rochester Shale, a relatively impermeable unit. Bedrock-surface contours in the site vicinity are shown in figure C-15.

Table C-10.--Type of chemical wastes deposited at the Occidental Chemical-Hyde Park Landfill, site 39, Niagara, N.Y., 1953-79.[1]
[Data from New York State Department of Environmental Conservation.]

Calcium fluoride	Trichlorophenol
Hexachlorocyclopentadiene derivatives	Benzotrifluoride derivatives
Mercury brine sludge	Benzoyl chloride
Organic phosphates	Liquid disulfides, chlorotoluene based disulfides
Dechlorane	Chlorobenzenes
Benzotrichloride	Benzyl chloride
Chlorotoluenes	Thiodan
Chlorindic acid ($C_9H_4O_4Cl_6$)	Miscellaneous chlorinations
Dodecylmercaptan	Acid chlorides

REF- 17

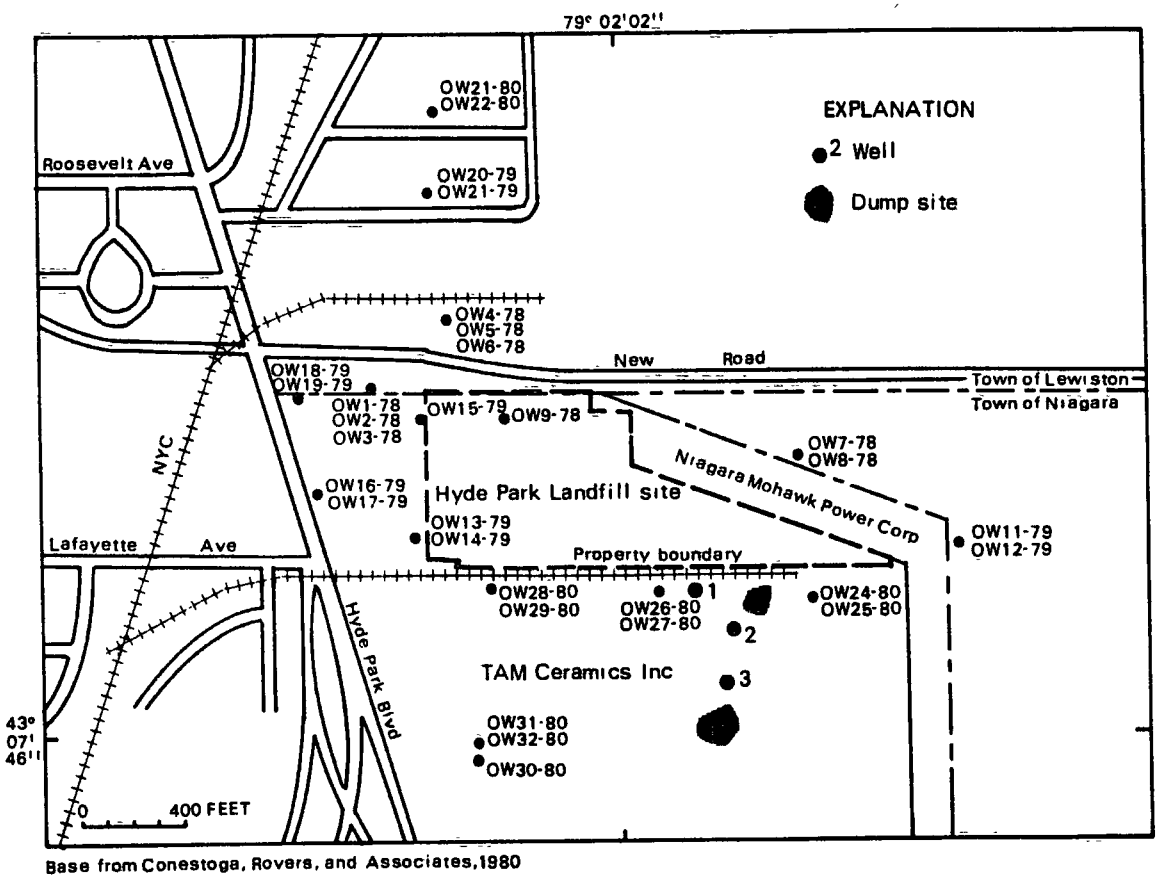


Figure C-14. Location of monitoring wells, Occidental Chemical--Hyde Park Landfill, site 39, Niagara Falls.

Hydrologic information.--The ground-water flow system in the area is described by Johnston (1982) as a horizontally layered system bordered on three sides by ground-water drains. These drains are (1) the Niagara River Gorge to the west, which penetrates below the Rochester shale; (2) the canal of the Niagara River Project to the north, which penetrates the Rochester shale; and (3) the buried conduits of the power project to the east, which fully penetrate the Lockport Dolomite. Ground-water recharge is estimated to be slightly less than 6 in/yr (Johnston, 1982). Ground water entering the area moves to one of these three discharge areas.

The ground-water flow regime was modeled by Johnston (1982), who suggests that ground water in the immediate vicinity of the landfill in the upper 10 to 15 ft of the Lockport Dolomite flows northwest toward the Niagara River. The potentiometric surface and direction of ground-water flow in the upper part of the Lockport Dolomite is shown in fig. C-16.

Johnston's ground-water model indicates a ground-water divide east of the landfill; ground water east of the divide flows eastward toward the conduits, while ground water west of the divide flows northwestward toward the Niagara

REF- 17

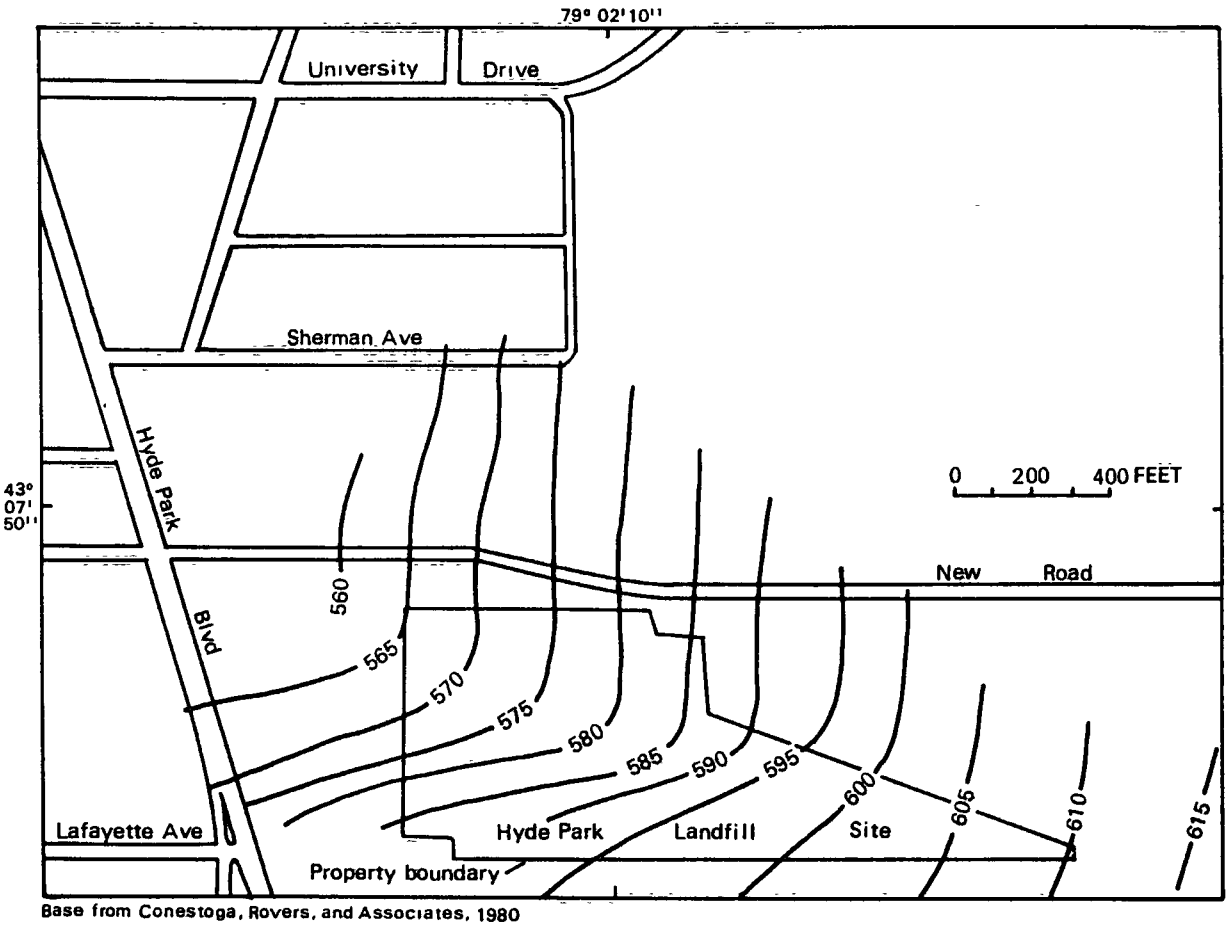
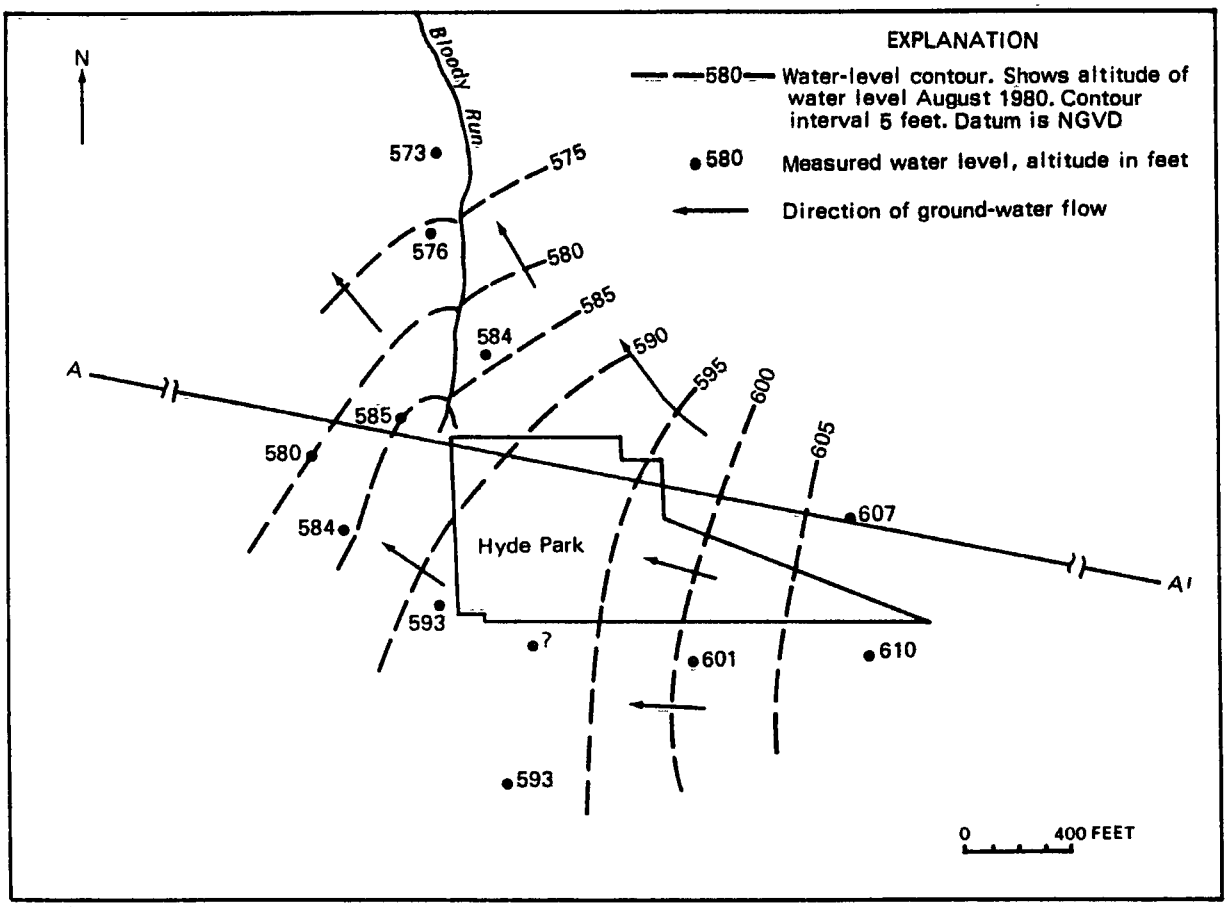


Figure C-15. Altitude of top of the Lockport Dolomite, Occidental Chemical--Hyde Park Landfill, site 39, Niagara Falls. (Modified from Conestoga-Rovers and Associates, 1982.)

River gorge. The model also indicates that ground water in the lacustrine unit and till near the landfill flows horizontally (northwestward) and downward into the Lockport Dolomite. Permeabilities calculated from pumping tests of wells tapping the overburden or bedrock-till interface are given in table C-11. West of the landfill, ground water in the unconsolidated deposits flows mainly downward.

The flow regime of the bedrock aquifer is controlled mainly by the distribution of joints and fractures. The upper 10 to 15 ft of the Lockport Dolomite is highly fractured and is the most permeable zone in the area (Johnston, 1964). Beneath this zone, the joints are narrower, although some horizontal bedding planes are partly open. Ground water in the upper Lockport layers flows northwestward horizontally to the vicinity of the Niagara River gorge, where weathering of the gorge wall has increased the vertical and horizontal fracturing and allows ground water to move downward (Johnston, 1982). Installation of piezometers as close as possible to the gorge wall could verify this interpretation. Most ground water flows through the upper and lower Lockport Dolomite; only a small percentage moves through the Rochester shale and the unconsolidated deposits.

REF- 17



Data from Johnston, 1982

Figure C-16. Water levels in upper part of Lockport Dolomite, Occidental Chemical--Hyde Park Landfill, site 39, Niagara Falls.

Estimated traveltimes for ground water to move the 3,000 feet from the landfill to the gorge through the respective units are as follows: till, 490 years; upper Lockport Dolomite, 4.9 years; lower Lockport Dolomite, 6.0 years. Estimated traveltime to move vertically to the bottom of the Rochester shale is 38 years (Johnston, 1982).

Chemical information.--Many ground-water samples have been collected on and near the site; results of analyses are given in several progress reports by Conestoga-Rover and Associates (1979a, b, c; 1980). In addition, the U.S. Environmental Protection Agency has collected soil and water samples along the Niagara River gorge; results are given in a report by West Coast Technical Service, Inc. (1982). The site is currently undergoing extensive sampling by the owner.

The data collected thus far indicate that leachate generated in the landfill has infiltrated through the overburden and into upper part of the Lockport Dolomite. Elevated concentrations of heavy metals and organic compounds have been found in both units.

Table C-11.--Permeability of overburden at Occidental Chemical-Hyde Park Landfill, site 39, Niagara Falls, N.Y.
[Locations are shown in fig. C-18. Data from Conestoga-Rovers and Associates, 1978.]

Well number[1]	Average K (permeability factor (cm/s)	Location of screen
OW 2-78	7.0×10^{-7}	overburden
OW 3-78	4.9×10^{-7}	interface
OW 5-78	7.3×10^{-5}	interface
OW 6-78	9.4×10^{-5}	overburden
OW 8-78	9.8×10^{-6}	interface
OW 9-78	8.9×10^{-7}	overburden
OW 10-78	6.0×10^{-6}	interface

[1] Observation wells drilled in 1978.

Sources of data

Anderson, E. G., 1982, Hydrogeology review, Hyde Park Landfill: Ontario, Canada, Gartner Lee and Associates, 19 p.

Conestoga-Rovers and Associates, 1979a, Progress report I, Hyde Park Landfill: Waterloo, Ontario, Candada, 17 p.

_____1979b, Progress report III, Hyde Park Landfill, Bloody Run, and 102nd Street Landfill, Waterloo, Ontario, Canada, 27 p.

_____1979c, Progress report IV, Hyde Park Landfill and Bloody Run: Waterloo, Ontario, Canada, 33 p.

_____1979d, Progress report V, Hyde Park Landfill, Bloody Run and 102nd Street Landfill: Waterloo, Ontario, Canada, 23 p.

_____1980, Progress report VIIIA, Hyde Park-Bloody Run: Waterloo, Ontario, Canada, 18 p.

Johnston, R. H., 1964, Ground water in the Niagara Falls area: New York Water Resources Commission Bulletin GW-53, 93 p.

Masila, M. L., and Johnston, R. H., 1982, Simulation of ground-water flow in the vicinity of Hyde Park Landfill, Niagara Falls, New York: U.S. Geological Survey Open-File Report 82-159, 19 p.

West Coast Technical Service, Inc., 1982, Final report to the U.S. Environmental Protection Agency (Water and soil samples from the Niagara River Gorge): Cerritos, Calif., 78 p.

REF 17

Table C-12.--Results of permeability tests at Occidental Chemical, Buffalo Ave. Plant, sites 41b-49, Niagara Falls, N.Y., January 7-8, 1980.[1]

Well no.	Saturated thickness (ft)	Transmissivity (gal/d)/ft	Transmissivity (cm^2/s)	Permeability (gal/d)/ft	Permeability (cm/s)	Formation material
B-5A	5.5	390	5.6×10^{-1}	70.9	3.3×10^{-3}	Fill
B-7A	14.5	195	2.8×10^{-1}	13.4	6.3×10^{-4}	Silty fill
B-8A	19.0	106	1.5×10^{-1}	5.6	2.6×10^{-4}	Silty fill
B-10A	8.0	1	1.5×10^{-3}	0.13	6.1×10^{-6}	Silty fill
B-10A	7.5	63	9.1×10^{-2}	8.4	4.0×10^{-4}	Silty fill
B-13A	20.0	Recovered too quickly for evaluation		200*	9×10^{-3}	Fill
B-14A	7.0	Recovered too quickly for evaluation		200*	9.0×10^{-3}	Fill
B-14B	16.0	2	2.9×10^{-3}	0.13	6.1×10^{-6}	Very fine sand
B-15A	19.0	34	4.9×10^{-2}	1.8	8.5×10^{-5}	Very fine sand
B-16A	6.5	552	7.9×10^{-1}	85	4.0×10^{-3}	Fill
CW-1A	7.0	Recovered too quickly for evaluation		200*	9.0×10^{-3}	Fill
CW-1B	10.0	102	1.5×10^{-1}	10.2	4.8×10^{-4}	Very fine sand
TRW-1A**	5.5	554	7.9×10^{-1}	100	4.7×10^{-3}	Fill

[1] Data from Leggette, Brashears, and Graham, Inc. (1980).
* Arbitrarily assigned value.
** Pumping test run in July 1979.

51. TAM CERAMICS (Literature review) NYSDEC 932028

General information and chemical-migration potential.--The TAM Ceramics site, in the northern part of the city of Niagara Falls, contains several small shallow landfills for disposal of obsolete equipment, ceramics, and metallic salts. The site contains 12 monitoring wells (fig. C-25).

Nonaqueous-phase organic compounds have been found in the sewerlines of the TAM property that are attributable to the Hyde Park Landfill (site 39). As a result, several new wells were installed on the TAM property by Occidental

Chemical Corporation as part of the aquifer survey program at the Hyde Park site. Geohydrologic information would be needed to determine the movement of contaminants from this site. The potential for contaminant migration is indeterminable.

Hydrologic information.--Water levels were measured in nine of the monitoring wells. Water levels decrease with well depth and toward the west, which indicates downward and westward movement of ground water. No water-level information is available from wells 1, 2, or 3.

Chemical information.--TAM sampled wells 1, 2, and 3 in June 1979 and analyzed for several metals, pH, 28 priority pollutants, and several other nonpriority organic compounds. Well 1, nearest to the Hyde Park landfill, contained several compounds in significant concentrations; data are available from NYSDEC, Buffalo, N.Y.

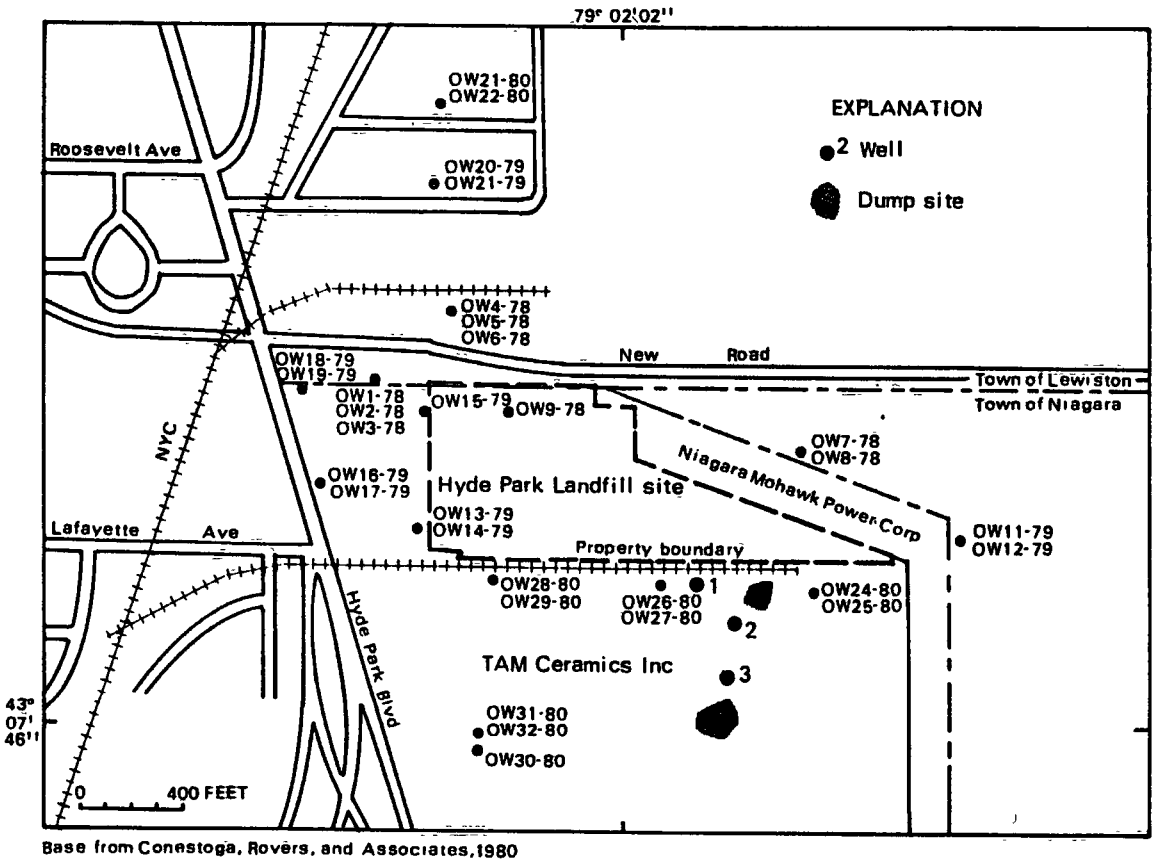
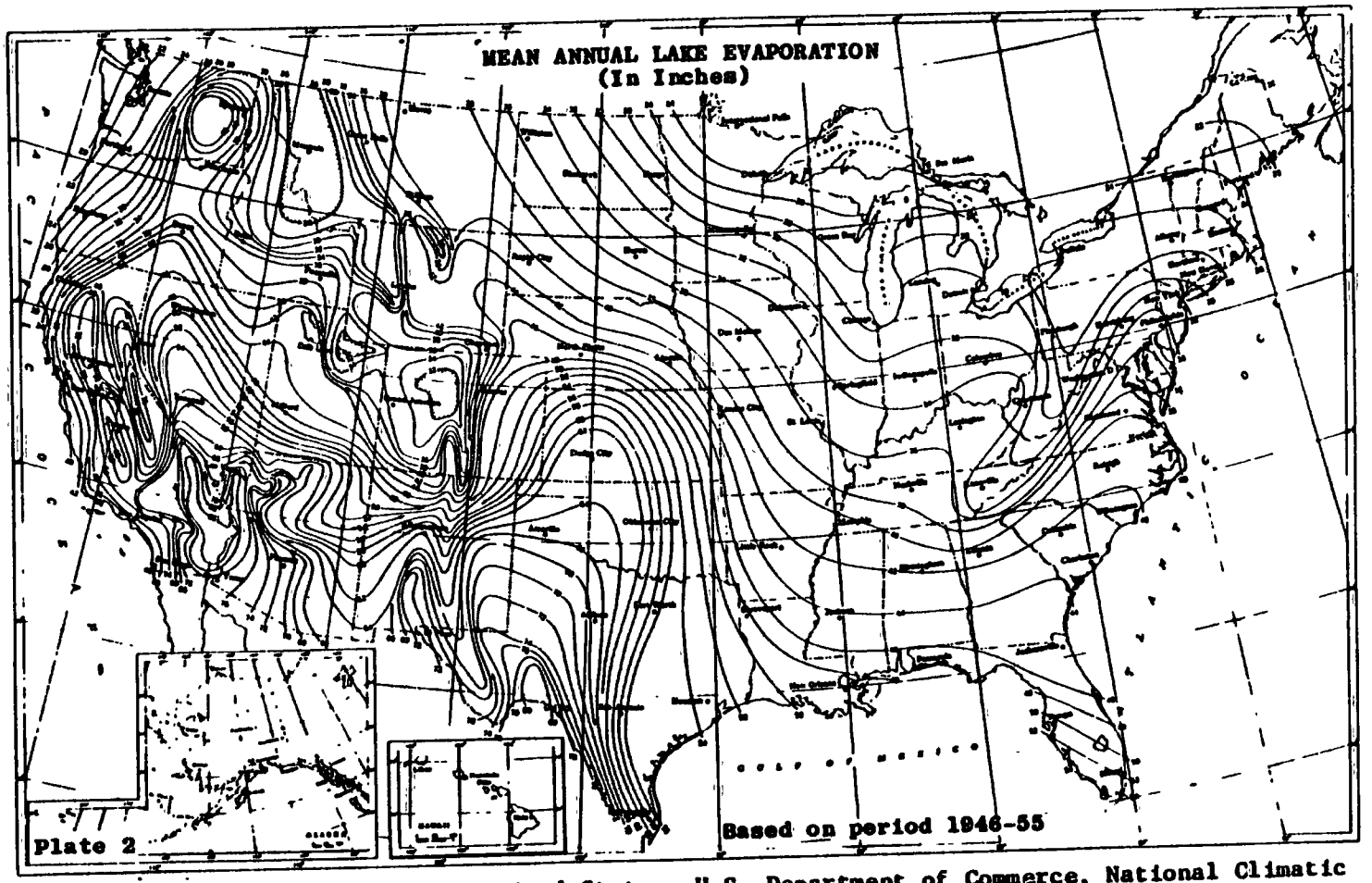


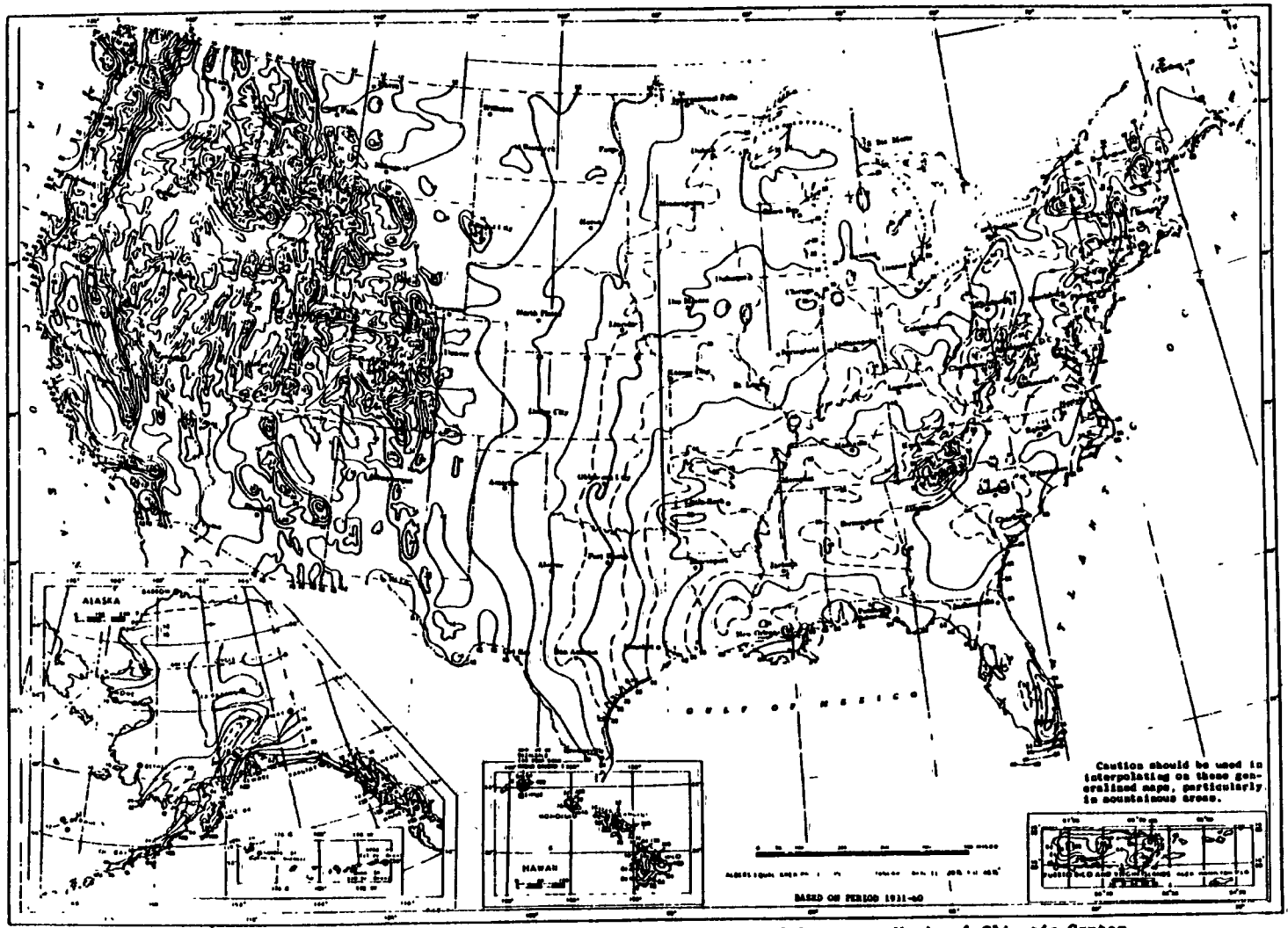
Figure C-25. Location of monitoring wells at TAM Ceramics, site 51, Niagara Falls.



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 4
MEAN ANNUAL LAKE EVAPORATION
(IN INCHES)

REF-18

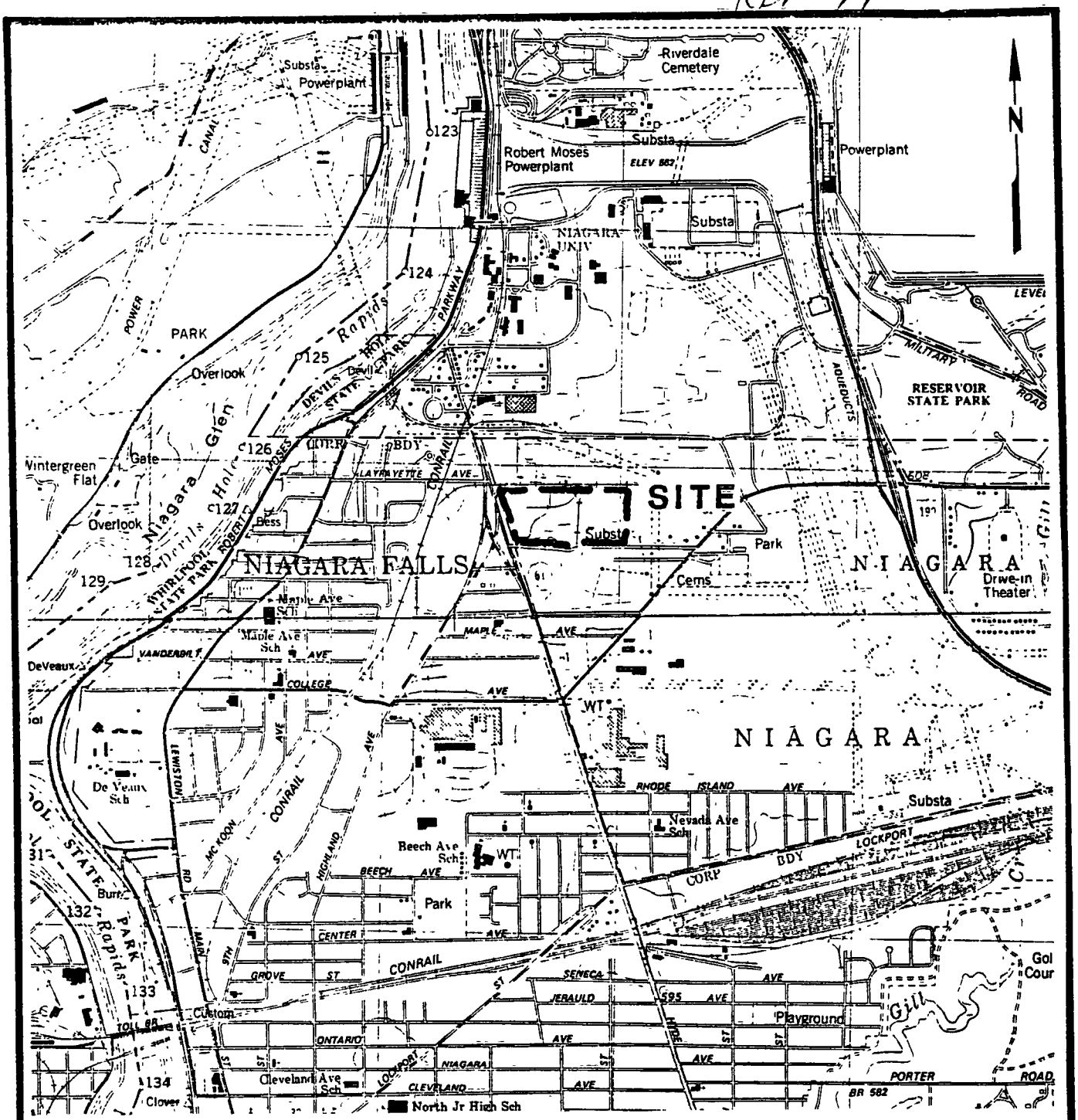


Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 5
NORMAL ANNUAL TOTAL PRECIPITATION (INCHES)

REF-13

REF-19



LATITUDE: 43°07'42" N
LONGITUDE: 79°02'13" W

SCALE

0 1000 2000 3000 4000 FEET

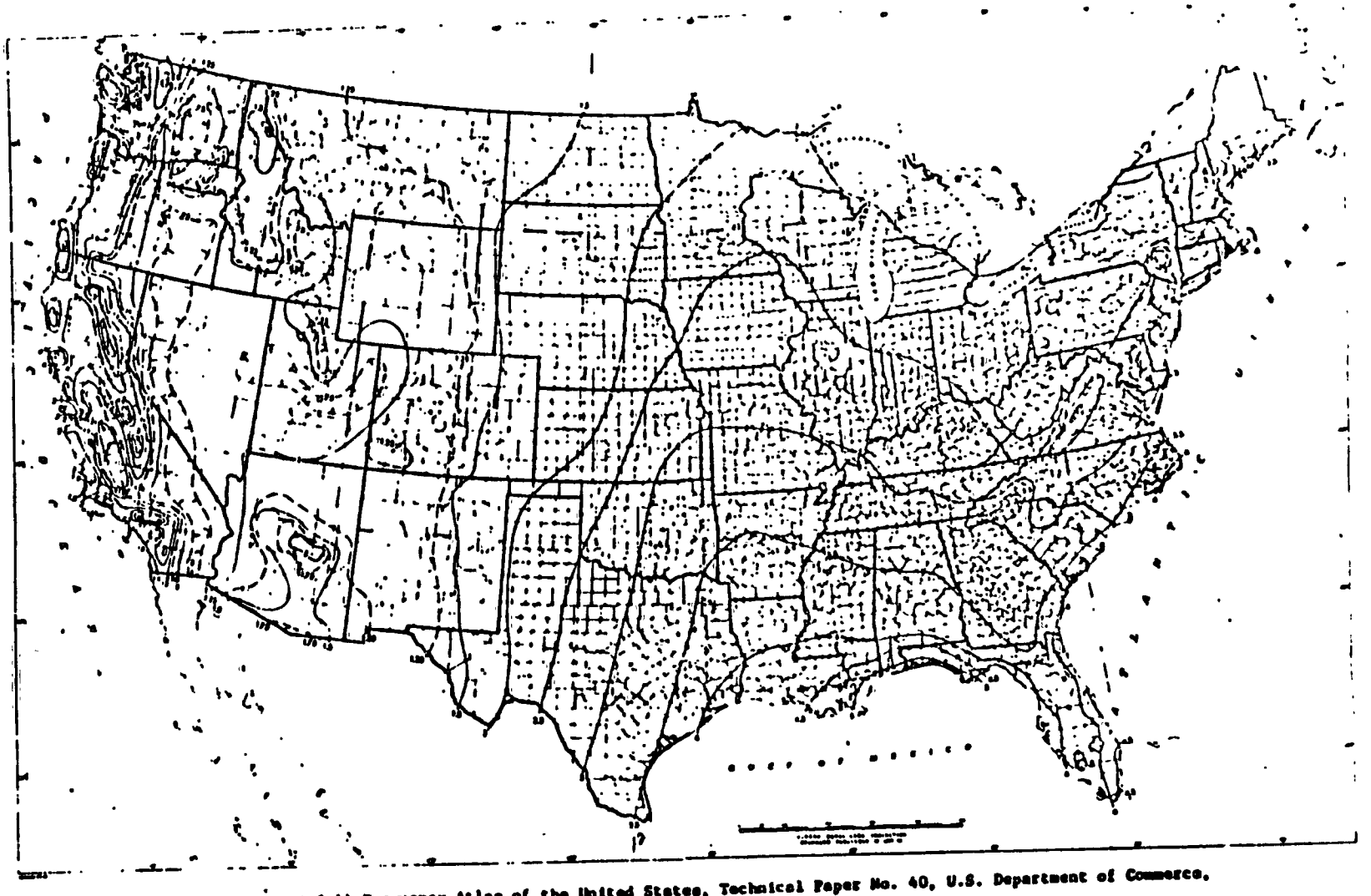
REFERENCE: U.S.G.S. 7.5' Topographic Map
Lewiston, NY-ONT (1980) and Niagara Falls,
NY-ONT (1980) Quadrangles

ENGINEERING-SCIENCE, INC.
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE I REPORT

SITE LOCATION MAP
TAM CERAMICS

FIGURE V-1



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

Figure 8

1-Year 24-Hour Rainfall (Inches)

BILLING CODE 6560-50-C

USDOI, 1983

Federal Register

Tuesday
March 1, 1983

21

Part III

Department of the Interior

National Park Service

National Registry of Natural Landmarks

USDOI, 1983

(21)

NATIONAL REGISTER OF HISTORIC PLACES

ANNUAL LISTING OF PROPERTIES

JANUARY 1979 THROUGH DECEMBER 1982

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

JULY 1983

KEF 22

INTERVIEW FORM

INTERVIEWEE/CODE Dennis Smith/James Walsh/Wm. Soley /

TITLE - POSITION

ADDRESS 4511 Hyde Park

CITY T. of Niagara Falls STATE NY ZIP

PHONE ( ) RESIDENCE PERIOD TO

LOCATION TAM Ceramics INTERVIEWER Larry Keefe/Cathy Bosma/ Mike Hopkins

DATE/TIME 12/11/85 / 2:00 p.m.

SUBJECT: Phase I Site Investigations: TAM Ceramics

REMARKS: 1948-1979 NL INdustries owned. Oct 1979-present= TAM Ceramics are owners. Both buried and above-ground industrial wastes (actual description in Interagency Report) were disposed on site (near RR tracks). Above ground material was taken off site to Model City Landfill. Attempts were made to locate and sample the underground wastes. No data were found. Proposed location of underground and actual location of above ground are shown on the plan. A30 present used approx. 25 million gallons per year (raw mat'ls)of zirconium silicate (zircon). After 1974: no titanium was used in process. Holes A & B (see plan) indicated OCC/Hyde Park contaminates, no contaminates from Hole C. During construction of Bldg. 155: found rock at 14 ft below grade. Occidental has monitoring wells on site: established in 1981. There are 5 residences in vicinity with working water wells (see plan). Occidental owns Hyde Park Landfill (Hooker: old owners).

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE: /s/ J. Walsh (TAM Ceramics); Dennis M. Smith; William T. Soley

COMMENTS:

REF-22

INTERVIEW FORM

INTERVIEWEE/CODE Dennis Smith / James Walsh / Wm. Doley 1

TITLE - POSITION

ADDRESS 4511 Hyde Park

CITY N. Niag Falls STATE NY ZIP

PHONE ( ) RESIDENCE PERIOD TO

LOCATION TAM Ceramics INTERVIEWER Larry Kelly / Cathy Brooma / Mike Lapkin

DATE/TIME 2:00pm 12-1-83 1

SUBJECT: Phase I Site Investigation: TAM Ceramics

REMARKS: 1948-1971 NL Industries owned, Oct 1974-Present: TAM Ceramics owned and operated. Both buried & above-ground industrial wastes (actual description in Interagency Report) were disposed on site (near railroad tracks). Above ground matl was taken off-site to Model City Landfill. Attempts were made to locate & sample the underground wastes. No data was found. Proposed location of underground & actual location of above ground are shown on the plan. At present used approx. 25 million pounds per year (raw matl) of zirconium silicate (zircon). After 1974: no titanium was used in process. Refer A & B (see plan). Radiation indicated occ. Hyde Park contamination, no contamination from Olde C. During construction of Bldg 155: found rock at 14' below grade. Occidental has monitoring wells on site: established in 1981. There are 5 residents in vicinity of working water wells (see plan). Occidental owns Hyde Park Landfill (Hooker: old owners)

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE: J. Walsh TAM Ceramics Inc

Dennis M. Smith

COMMENTS: William F. Doley

REF-23

TAM Ceramics

June 1, 1981

Mr. Dan Hurley
Associated Lead
2545 Aramingo Ave.
Philadelphia, Pa. 19125

Dear Dan:

We removed:

1. 500 tons of iron carbon titanium alloy complete with the broken arc furnace shells.

2. 740 cu.yds. est. 1,000 tons of inert slag and scrap.

3. 4 drums zirconium oxychloride.

4. 12 drums zircon fused salts.

5. 20 drums ammonium zirconia carbonate solution (3.6 tons).

This is all material above ground level. All buried materials as reported to the Interagency Task Force on Hazardous Wastes remains in ground.

Our cost was $42,000 on item #2 above and about $4,000 on the balance.

Jim W

James L. Walsh
Engineering Manager

cc: J.F.Kilpatrick

JLW/ljg

Tam Ceramics Inc., Box C., Bridge Station, Niagara Falls, New York 14305
Telephone — (716) 278-9400 TWX — (710) 524-1659
Cables — Tamceram, Niagara Falls, New York

REF-23

5. Identify all Treatment or Disposal Sites in Erie or Niagara County used since 1930 (use separate sheet for each site).

a. Name of Site NL Industries, Inc. ICD/Niagara

b. Location 4511 Hyde Park Blvd. Niagara Falls, New York

c. Owner or Operator Same

d. Time Period Site was Used 1930-1976

e.

Describe Waste Types Treated or Disposed at this Site	Physical State	Total Quantity	Type of Container, If Any
(1) Uncalcined titanium oxide	Solid	Rough Est. 385 tons	None
1-a. Ammonium Zirconium Carb.Sol.	Liquid	Rough Est. 3.6 tons	Steel Drum
(2) Magnesium chloride, with zirconium impurity	Solid	Rough Est. 43 tons	Steel Drums
(3) Zirconium-sodium-potassium chloride mixture(fused salt)	Solid	Rough Est. 3.3 tons	Steel Drums
(4) Aluminum oxide, with titania impurity	Solid	Rough Est. 2,000 tons	None
(5) Iron-carbon-titanium Alloy	Solid	Rough Est. 500 tons	Steel Shell
(6) Silica fume (with motor oil)	Solid/sludge	Rough Est. 50 tons	None
(7) "Ivex" Lotion(ammonium zirconium carbonate	Liquid	Rough Est. less than 1 ton	Plastic bottles

f. Wastes Were [X] land disposed [ ] incinerated [ ] reclaimed [ ] treated [ ] other (specify) (1.a.) item (5) above ground

g. Names of waste haulers including your company transporting such wastes to this site, if a disposal site.

NL Industries Inc. 278-9401
Name Telephone

4511 Hyde Park Blvd. Niagara Falls New York
Street City State

Time Periods such Hauler Transported to this Site 1930 - 1976

Name Telephone

Street City State

Time Periods such Hauler Transported to this Site

h. List Names and Addresses of other Companies using this Site, if a disposal site.

Name of Company

Street City State

Time Periods such Other Company Used this Site

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: —

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
TAM Ceramics	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
4511 Hyde Park Blvd	

05 CITY	06 STATE	07 ZIP CODE
N. Niagara Falls	NY	14302

08 YEARS OF OPERATION	09 NAME OF OWNER
Oct. 79 - Present	TAM Ceramics

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
Cookson PLC	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE
London, England		

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER
NL Industries	

03 STREET ADDRESS (P.O. Box, RFD #, etc.) (212) 371-9453	04 SIC CODE
1230 Avenue of the Americas	

05 CITY	06 STATE	07 ZIP CODE
New York	NY	10020

08 YEARS OF OPERATION	09 NAME OF OWNER ~~DURING THIS PERIOD~~
1948 - 1979 (31)	Wm Bronner

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER
Titanium Alloy Manuf. Co.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD
Before 1948	

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

ES and D&M Site Visit 12-11-85.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: —

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
TAM Ceramics (NL Industries)	4511 Hyde Park Blvd.				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Town of Niagara	NY	14302	Niagara	063	33
09 COORDINATES LATITUDE: 43°07'46"	LONGITUDE: -19°02 02"				

10 DIRECTIONS TO SITE (Starting from nearest public road)
From Niagara Falls drive north on Hyde Park Blvd., site is at 4511 Hyde Park Blvd. just north of Pennsylvania Ave.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
TAM Ceramics	4511 Hyde Park Blvd.			
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER	
T. Niagara Falls	NY	14302	(716) 278-9400	
07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)			
TAM Ceramics	same			
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER	
same			( )	

13 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☑ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE 12/11/86 (MONTH DAY YEAR) ☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☑ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): Cathy Bosma (ES) and Larry Keefe (D&M), 12/18

02 SITE STATUS (Check one)
☐ A. ACTIVE ☑ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1930 (BEGINNING YEAR) | 1976 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Uncalcined titanium oxide, ammonium zirconium carbon soln, magnesium chloride w/ zirconium impurity, zirconium-sodium-potassium chloride mixture, iron-carbon-titanium alloy, silica fume, and Irex Lotion. Chlorobenzene, trichlorobenzene, hexachlorocyclohexane, hexachlorocyclopentadiene.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Site enclosed by gates & guarded. 5 ~~drinking~~ water wells exist < ½ mile away. Material still in ground has potential to migrate to these wells. Hyde Park Landfill is located nearby and contaminates from their site have been observed on TAM Ceramic's property.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☑ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency Organization)		03 TELEPHONE NUMBER
Cathy J. Bosma	Engineering-Science (ES)		(703) 591-7575
04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Cathy J. Bosma		ES	( ) same	1/6/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [X] C. SLUDGE
- [ ] D. OTHER (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: 2486

CUBIC YARDS:

NO. OF DRUMS:

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	50	tons	Silica fume
OLW	OILY WASTE			
SOL	SOLVENTS	5	tons	Ammonium Zirconium carbonate
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			Quantity Unknown
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	2931	tons	

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Titanium Oxide	13463677			
MES	Magnesium Chloride	7786303			
MES	Aluminum Oxide	1344281			
OCC	monochlorobenzene	108-90-7	? from Hyde Park Landfill	11-24,000	ppb
OCC	trichlorobenzene	999		28-1600	
OCC	hexachlorocyclopentadiene	77-47-4		16-126	
OCC	hexachlorocyclohexane	999		10-1400	
OCC	monochlorotoluene	999		25-11,000	
OCC	tetrachlorobenzene	95-94-3		20-190	ppb

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	None		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references e.g., state files, sample analysis, reports)

Interagency Task Force on Hazardous Wastes, March 1979

Hyde Park Landfill Sampling Data, 1983

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: NY	02 SITE NUMBER:

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 15 — 04 NARRATIVE DESCRIPTION

Contamination from Hyde Park Landfill observed from EPA studys. Potential for contaminant migration from TAM site. See Hyde Park Landfill data, 1983

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Runoff from site into sewer system. Discharge permit (SPDEC) on file.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unlikely due to buried wastes and nature of wastes; none measured.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unlikely

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 400 — 04 NARRATIVE DESCRIPTION

Open pit for motor oil disposal. Population consists of factory workers only.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 30 (Acres) — 04 NARRATIVE DESCRIPTION

Unlined landfill

01 ☒ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 15 — 04 NARRATIVE DESCRIPTION

5 Residences with private wells on Pennsylvania Ave.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No record.

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No record.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noticed

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

None noticed

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not likely

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff Standing liquids, Leaking drums) — 02 ☒ OBSERVED (DATE. 12/85) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Open waste oil pit.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No record of damage

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Site has SPDEC permit. Uncontroled runoff possible.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Limited access; none noticed

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 15

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

NCHD (1985)
EPA study, Hyde Park Landfill, 1983
Inter Agency Task Force Report, 1979

EPA FORM 2070-13 (7-81)

TAM Ceramic Disclosure, 1981

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Dennis Smith Interview, ES and D&M, Dec 1985
Interagency Task Force, March 1979.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NM	

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☑ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
TAM Ceramics (NL Industries)	4511 Hyde Park Blvd.

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
T. of Niagara Falls	NY	14302	Niagara	063	33

09 COORDINATES LATITUDE 43° 07' 46" — LONGITUDE 79° 02' 02"

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
12 11 85 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1930 (BEGINNING YEAR) 1976 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Engineering Science (ES) and Dames & Moore (D&M) (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Cathy J. Bosma	Civil Engineer	ES	(703) 591-7575
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Larry Keefe	~~A~~ Geologist	D&M	(315) 638-2572
Mike Hopkins	Niagara Co. Health Dept.		(716) 284-3124
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Dennis Smith			( )
James Welsh	Eng. Manager	Box C, Bridge Station Niagara Falls, NY 14305	(716) 278-9400
William Soley	Facilities Eng.	same	( ) same
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	2:00 pm	Overcast, ground wet from previous snow

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Cathy J. Bosma	Engineering-Science (ES)	(703) 591-7575

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Cathy J. Bosma		same	same	1 6 86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [X] C. SLUDGE
- [ ] D. OTHER (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: 2986

CUBIC YARDS:

NO. OF DRUMS:

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	50	tons	Silica fume
OLW	OILY WASTE			
SOL	SOLVENTS	5	tons	Ammonium Zirconium Carbonate
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			Unknown Quantity
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	2931	tons	

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Titanium Oxide	1346771			
MES	Magnesium Chloride	7786303			
MES	Aluminum Oxide	1344281			
OCC	mono, chloro, benzene	108-90-7	? from Hyde Park Landfill	11-24000	ppb
	trichlorobenzene	999		28-1600	
	hexachlorocyclopentadiene	77-47-4		16-126	
	hexachlorocyclohexane	999		18-14000	
	mono chlorotoluene	999		25-11000	
OCC	tetrachlorobenzene	95943		20-190	ppb

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	None		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Interagency Task Force on Hazardous Wastes, March 1979
Hyde Park Landfill Sampling Data, 1983.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 15
04 NARRATIVE DESCRIPTION
Contamination from Hyde Park Landfill observed from EPA studys. Potential for contaminant migration from TAM site. See Hyde Park Landfill data, 1983.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
Runoff from site into sewer system. Discharge permit (SPDEC) on file.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
Unlikely due to buried wastes and nature of wastes; none measured.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
Unlikely

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 400
04 NARRATIVE DESCRIPTION
Open pit for motor oil disposal. Population consists of factory workers only.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 30 (Acres)
04 NARRATIVE DESCRIPTION
Unlined landfill

01 ☒ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 15
04 NARRATIVE DESCRIPTION
5 Residences with private wells on Pennsylvania Ave.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
No record.

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
No record.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None noticed

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

None noticed

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not likely

01 ☒ M UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff Standing liquids Leaking drums) — 02 ☒ OBSERVED (DATE 12/85) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

Open waste oil pit.

01 ☐ N DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No record of damage

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Site has SPDEC permit. Uncontroled runoff possible.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Limited access; none noticed

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 15

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references e g, state files sample analysis, reports)

NCHD (1985)
EPA study, Hyde Park Landfill, 1983
Inter Agency Task Force Report, 1979
TAM Ceramic Disclosure, 1981

EPA FORM 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES	None			
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES	1	ton
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL	2985	ton
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER None (Specify)

05 OTHER

☑ A. BUILDINGS ON SITE
Site itself (plant)

06 AREA OF SITE

30-50 (Acres)

07 COMMENTS Iron carbon titanium alloy, inert slag & scrap, drum and drums of zirconium oxychloride, zircon fusel salts, and ammonium zirconia carbonate solution were removed from above ground storage and taken to Modern City Landfill. Approx. 2986 tons of wastes are currently buried at the site. The facility is still operating but wastes have not been disposed of on site since 1976. Piles of zirconium chlorinated scrap were found on site during the site visit.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☑ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Drums were removed. No liners and unknown cover of buried material. Piles of zirconium chlorinated scrap found on site. Piles are uncovered and approx. one foot high

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☑ NO

02 COMMENTS Fence around site with 24 hour guard.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

ES & D&M site visit 12-11-85.
Interagency Task Force on Hazardous Wastes, March 1979

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☐
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE
A. _____ (mi)
B. < 0.25 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)
☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER ≈15

03 DISTANCE TO NEAREST DRINKING WATER WELL < 0.25 (mi)

04 DEPTH TO GROUNDWATER 20 (ft)

05 DIRECTION OF GROUNDWATER FLOW NNW

06 DEPTH TO AQUIFER OF CONCERN 10 (ft)

07 POTENTIAL YIELD OF AQUIFER _____ (gpd)

08 SOLE SOURCE AQUIFER ☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)
Private residential wells (5) on Pennsylvania Ave. NCHD has sample wells and determined elevated levels of contaminants.

10 RECHARGE AREA
☐ YES ☐ NO
COMMENTS:

11 DISCHARGE AREA
☐ YES ☐ NO
COMMENTS:

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)
☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Niagara River	☐	0.4 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 8972 NO. OF PERSONS	B. 28,897 NO. OF PERSONS	C. 51,745 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION _____ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE _____

04 DISTANCE TO NEAREST OFF-SITE BUILDING _____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)
Commercial and residential area of Niagara Falls.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
20 (ft)	unknown (ft)	unknown	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
9 (in)	2 1 (in)	2 %	NNW	2 %

09 FLOOD POTENTIAL
SITE IS IN < 500 YEAR FLOODPLAIN

10
☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. 3.0 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
_____ (mi)
ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 0 (mi)	B. 0.25 (mi)	C. > 2 (mi)	D. > 2 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Disposal area is an open field on the eastern portion of the TAM Ceramics property. Above ground wastes were removed; however, below grade/buried wastes have not been removed. Residential areas are to the east and west, Hyde Park Landfill to the north, and other industrial properties to the south.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NCHD, 1985; EPA Study, Hyde Park Landfill, 1983; Site visit, 1985; CFR 40, Part 300, App A; NYS Atlas of Community Water System Sources, 1982

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
TAM Ceramics		4511 Hyde Park Blvd.	1	N. Niagara Falls	NY	14302

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
Cookson PLC				London, England		

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
NL Industries (Wm. Brenner		(212) 399-9453 1230 Avenue of the Americas		New York	NY	10020
Titanium Alloy Manuf. Co						

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

ES and D&M site visit 12-11-85

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
NL Industries	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

ES and D&M Site Visit 12-11-85
Interagency Task Force on Hazardous Waste.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: —

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER		None	
SURFACE WATER		↓	
WASTE		↓	
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER		None	

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Photovac - TIP	Readings were taken upwind and downwind of the site. No readings above background were recorded.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF Engineering-Science
(Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS: Site Map of site was updated during site investigation

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Site map showing waste dumps 10-30-78. Obtained from Dennis Smith.
NL Industries process flow diagram
well sampling results: to be obtained from DEC. (Obtained 2-3-86)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

ES and D&M Site Inspection 12-11-85

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Not Applicable

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ G. WASTE DISPOSED ELSEWHERE — 02 DATE 1981 — 03 AGENCY JAM Ceramics
04 DESCRIPTION
Drums and waste piles taken to Modern City's Landfill.

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

SITE SAFETY AND HEALTH PLAN

INDUSTRIAL WASTEWATER PRETREATMENT STUDY: PHASE I

POPE AIR FORCE BASE

Fayetteville, North Carolina

FEBRUARY 1995

for:

U.S. Army Corps of Engineers
Omaha District

USACE Contract No. DACW 45-93-0013
Delivery Order No. 003

SECTION VI

ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

ASSESSMENT OF DATA ADEQUACY

A summary assessment of the adequacy of existing data for completion of the HRS score is presented in Table VI-1. Insufficient information is presently available to complete an HRS score for this site.

PHASE II WORK PLAN

Objectives

The objectives of the Phase II activities are:

- To collect additional field data necessary to identify the occurrence and extent of contamination and to determine if any imminent health hazard exists.
- To perform a conceptual evaluation of remedial alternatives and estimate budgetary costs for the most likely alternative.
- To prepare a site investigation report including final HRS score.

TABLE VI-1

ASSESSMENT OF DATA ADEQUACY

HRS Data Requirement	Comments on Data
Observed Release	
Groundwater	Inadequate to score an observed release
Surface Water	Inadequate to score an observed release
Air	Inadequate for HRS score
Route Characteristics	
Groundwater	Adequate for HRS score
Surface Water	Adequate for HRS score
Air	Inadequate for HRS score
Containment	Adequate for HRS score
Waste Characteristics	Adequate for HRS score
Targets	Adequate for HRS score
Observed Incident	Adequate for HRS score
Accessibility	Adequate for HRS score

The additional field data required to complete this investigation are described as follows:

Geophysical Survey - A geophysical study consisting of a magnetometer survey is recommended. A magnetometer survey will be conducted as necessary on a grid system to aid in delineating the limits of the contaminated area.

Groundwater - A groundwater monitoring system utilizing the existing wells is recommended. The groundwater samples will be analyzed for HSL organics and metals.

Sediment - A sediment monitoring system consisting of 2 monitoring stations is recommended. One station (S-1) will be upgradient of the drainage ditch and the other (S-2) will be downgradient. Sediment samples will be analyzed for HSL organics and metals.

Air - An air monitoring survey with an HNU meter is recommended to test the air quality above the site.

TASK DESCRIPTION

The proposed Phase II tasks are described in Table VI-2.

COST ESTIMATE

The estimated man-hours required for the Phase II project are presented in Table VI-3 and the estimated project costs are presented by task in Table VI-4.

HEALTH AND SAFETY PLAN

The Health and Safety Plan will be submitted as a separate document.

QUALITY ASSURANCE PLAN

The Quality Assurance Plan will be submitted as a separate document.

TABLE VI-2

PHASE II WORK PLAN - TASK DESCRIPTION

	Task	Description of Task
II-A	Update Work Plan	Review the information in the Phase I report, conduct a site visit, and revise the Phase II work plan.
II-B	Conduct Geophysical Studies	Conduct magnetometer surveys.
II-C	Conduct Boring/Install Monitoring Wells	No further construction.
II-D	Construct Test Pits/Auger Holes	Construct 12 test/auger holes to a depth of five feet. Location will be based on geophysical survey results.
II-E	Perform Sampling & Analysis	
	Soil samples from borings	No further studies necessary.
	Soil samples from surface soils	No further studies necessary.
	Soil samples from auger holes	12 soil samples are to be collected and analyzed for HSL organics and metals.
	Sediment samples from surface water	2 sediment samples are to be collected and analyzed for HSL metals.
	Groundwater samples	3 groundwater samples are to be collected from the existing wells and analyzed for HSL metals.

TABLE VI-2, Continued

PHASE II WORK PLAN - TASK DESCRIPTION

Task		Description of Task
	Air samples	Using the HNU, determine the presence of organics.
	Waste samples	No further sampling necessary.
II-F	Calculate Final HRS	Based on the field data collected in Tasks II-B - II-E, complete the HRS form.
II-G	Conduct Site Assessment	Prepare final report containing Phase I report, additional field data, final HRS and HRS documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.
I-H	Project Management	Project coordination, administration and reporting.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PHASE II INVESTIGATION
COST ESTIMATE

SITE ID #: 932038
SITE NAME: TAM CERAMICS
CONSULTANT: ENGINEERING SCIENCE

TABLE VI-3

TASK DESCRIPTION	ESTIMATED HOURS OF DIRECT TECHNICAL LABOR (DTL)										TOTAL	
	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	HOURS	COST
II-A UPDATE WORKPLAN	4	16	4	12	4	52	32	32	24	52	232	3201.60
II-B CONDUCT GEOPHYSICAL STUDIES	2	4				80		160	10	10	266	3477.60
II-C CONDUCT BORING/INSTALL MONITORING WELLS											0	0.00
II-D CONSTRUCT TEST PITS/ AUGER HOLES	2	4				24		24			54	816.00
II-E SAMPLING AND ANALYSIS											0	0.00
Soil samples from borings											0	0.00
Soil samples from surface soils											0	0.00
Soil samples from auger holes/test pits											0	0.00
Sediment samples from surface water		1				8		8			17	242.00
Groundwater samples		2				24		24			50	700.80
Surface water samples											0	0.00
Air samples											0	0.00
Waste samples											0	0.00
II-F CALCULATE FINAL HRS SCORE	8	16	4	2	8	48	40	16	8	8	158	2528.70
II-G CONDUCT SITE ASSESSMENT	2	40	4		8	64	40	8	40	80	286	3965.20
II-H PROJECT MANAGEMENT	4	30	4	14	16						68	1525.40
TOTAL HOURS	22	113	16	28	36	300	112	272	82	150		
HOURLY RATE $	33.40	25.20	22.00	19.70	17.00	15.10	13.30	12.00	9.60	8.60		
DIRECT LABOR COSTS $	734.80	2847.60	352.00	551.60	612.00	4530.00	1489.60	3264.00	787.20	1290.00		

4/7/86

TOTAL DTL COSTS	16458.80
INDIRECT LABOR COSTS	19421.38
TOTAL LABOR COSTS	35880.18
PROFIT (15%)	5382.03
TOTAL PRICE	41262.21

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PHASE II INVESTIGATION
COST ESTIMATE

SITE ID #: 932038
SITE NAME: TAM CERAMICS
CONSULTANT: ENGINEERING SCIENCE

TABLE VI-4

TASK DESCRIPTION	DIRECT LABOR HOURS	DIRECT LABOR COST($)	SUBCONTR. COSTS $	SUPP.& EQUIP. $	MISC. $	TRAVEL & PER DIEM $	TOTALS $
II-A UPDATE WORK PLAN	232	3201.60		237	210	260	3908.60
II-B CONDUCT GEOPHYSICAL STUDIES	266	3477.60		1470	60	1920	6927.60
II-C CONDUCT BORING/INSTALL MONITORING WELLS	0	0.00					0.00
II-D CONSTRUCT TEST PITS/ AUGER HOLES	54	818.00		466	75	411	1770.00
II-E SAMPLING AND ANALYSIS	0	0.00	24600	578	60	1233	26471.00
Soil samples from borings	0	0.00					0.00
Soil samples from surface soils	0	0.00					0.00
Soil samples from test pits/ auger holes	0	0.00					0.00
Sediment samples from surface water	17	242.00					242.00
Groundwater samples	50	700.80					700.80
Surface water samples	0	0.00					0.00
Air samples	0	0.00					0.00
Waste samples	0	0.00					0.00
II-F CALCULATE FINAL HRS SCORE	158	2528.20		50	75		2653.20
II-G CONDUCT SITE ASSESSMENT	286	3965.20		750	1000	165	5880.20
II-H PROJECT MANAGEMENT	68	1525.40		400	40		1965.40
SUBTOTAL	1131	16458.80	24600.00	3951.00	1520.00	3989.00	
INDIRECT LABOR (118% DTL)		19421.38					
PROFIT (%)		15	5	5	5	0	
PROFIT ($)		5382.03	1230.00	197.55	76.00		
TOTAL COSTS ($)		41262.21	25830.00	4148.55	1596.00	3989.00	76825.76

4/7/86

APPENDIX A

REFERENCES
SOURCES CONTACTED DOCUMENTATION

SOURCES CONTACTED SUMMARY SHEET
TAM CERAMICS

Person Contacted/ Location	Telephone	Date	Information Collected
Glenn Hardcastle USEPA Headquarters, Superfund Office 401 M Street, SW Washington, DC 20469	202-382-5617	12/19/85	Reviewed list of sites to determine if additional information was available.
John Anderson USEPA-Region II EPA Information Office 345 3rd St. Suite 530 Niagara Falls, NY 14305	716-285-8842	01-06-86	General information from site files.
Charley Hudson NYSDEC - Div. of Envir. Enforcement Empire State Plaza Corning Tower Albany, NY 12237	518-474-2121	12-30-85	Draft Reports
Kevin Walter NYSDEC-Div. of Envir. Enforcement 50 Wolf Road Albany, NY 12233	518-457-4346	12-30-85	Reviewed list of sites to determine legal actions taken.
Walt Demick NYSDEC-Div. of Solid & Haz. Waste 50 Wolf Road Albany, NY 12233	518-457-0639		General information from site files.
Bob Hannaford NYSDEC-Div. of Water SPDES Files 50 Wolf Road Albany, NY 12233	518-457-6716		Reviewed SPDES files for permit numbers and conditions.

SOURCES CONTACTED SUMMARY SHEET (Continued)
TAM CERAMICS

Person Contacted/ Location	Telephone	Date	Information Collected
Val Washington NYS-Dept. of Law, Attorney General's Office Empire State Plaza Justice Building Albany, NY 12233	518-473-3105		Reviewed list of sites to determine if legal action has occurred in the past, is in progress, and/or is scheduled in the near future.
Jeff T. Lacey Peter Burke Glenn Bailey NYSDEC-Div. of Environmental Enforcement 600 Delaware Ave. Buffalo, NY 14202	716-847-4582	12-27-85	Reviewed list of sites to determine legal actions taken.
Peter Buechi Ahmad Tayyebi Bob Mitrey Larry Clare NYS-Region 9 Division of Solid & Hazardous Waste 600 Delaware Ave. Buffalo, NY 14202	716-847-4585	11-14-85	Collected information from site files.
Lou Violanti NYS-Regional Dept. of Health 584 Delaware Ave. Buffalo, NY 14202	716-847-4500	11-15-85	Sent site information to Peter Buechi.
Henry Sondonato Robert Armbrust Dick Dybowski Larry Stiller Jackie DiPronio NYSDEC-Region 9 Div. of Air 600 Delaware Ave. Buffalo, NY 14202	716-847-4565	11-15-85	Air emissions permits for sites.

SOURCES CONTACTED SUMMARY SHEET (Continued)
TAM CERAMICS

Person Contacted/ Location	Telephone	Date	Information Collected
Mike Wilkenson Jim Sneider NYSDEC-Region 9 Div. of Fisheries and Wildlife 600 Delaware Ave. Buffalo, NY 14202	716-847-4600	11-14-85	Endangered species information.
Marion Pfohl Spencer Schofield Erie and Niagara County Regional Planning Board 3103 Sheraton Dr. Amherst, NY 14226	716-837-2035	12-20-85	Census data, general site information.
Mike Hopkins Niagara County - Dept. of Health Tenth and East Falls St. Niagara Falls, NY 14302	716-284-3124	11-20-85 12-12-85	Collected information from Niagara County site file. Obtained additional information through interview.
Joanne Elsworth Niagara County - Envir. Mgmt. Div. 59 Park Avenue Lock Port, NY 14094	716-439-6033	12-20-85	Census data, general information.
Dennis Smith James Walsh William Soley TAM Ceramics 4511 Hyde Park Blvd. Niagara Falls, NY	716-278-9400	12-11-85	Site visit - history, disposal, etc.

REFERENCES

NYSDEC 1:12

GENERAL REFERENCES*

24. Johnson, Richard H., Groundwater in the Niagara Falls Area, New York, Bulletin GW-53, 1964.

25. NYS Museum and Science Service Bedrock Geology Map.

*Does not include "HRS References" which are provided directly after the HRS Documentation Records in Section V.

GROUND WATER IN THE NIAGARA FALLS AREA, NEW YORK

With Emphasis on the Water-Bearing Characteristics of the Bedrock

BY

RICHARD H. JOHNSTON

GEOLOGIST

U.S. GEOLOGICAL SURVEY

STATE OF NEW YORK

CONSERVATION DEPARTMENT

WATER RESOURCES COMMISSION

BULLETIN GW-53

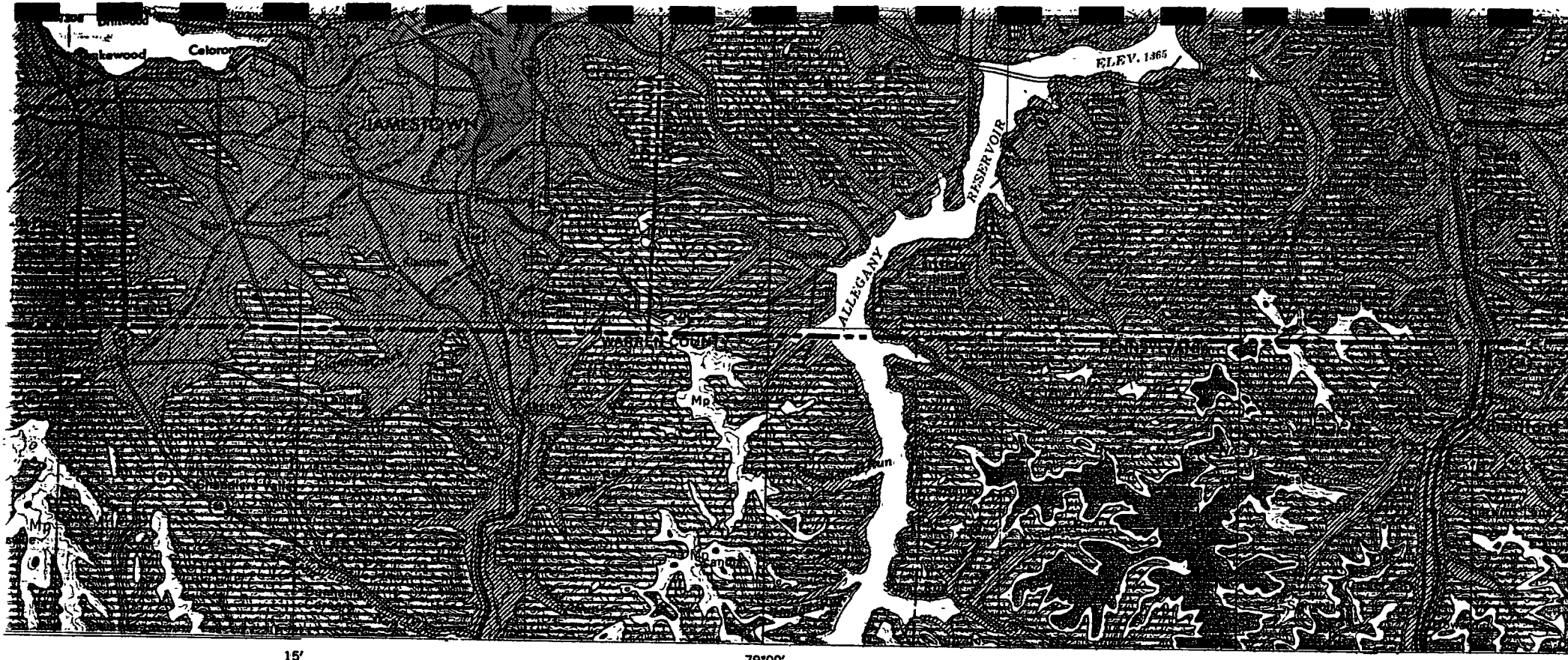
1964

. . . GEOLOGY OF THE NIAGARA FALLS AREA

The geology of the Niagara Falls area is well understood both because of its simplicity and because of the excellent exposures of bedrock along the Niagara River gorge and the Niagara escarpment. The discussion of geology in this report is limited to those features which directly affect the water-bearing characteristics of the various geologic units. The reader desiring additional geologic information is referred to the reports by Grabau (1901) and Kindle and Taylor (1913).

A thin cover of unconsolidated deposits overlies the bedrock throughout most of the Niagara Falls area. These unconsolidated deposits were laid down during the closing phases of the great ice age (Pleistocene Epoch). The deposits consist of three types: (1) glacial till (locally called "stony hardpan") which is an unsorted mixture of boulders, clay, and sand which was deposited by the ice sheet that covered the area about 10,000 years ago; (2) clay, silt, and fine sand which was deposited in lakes that formed during the melting of the ice sheet; and (3) sand and gravel which was either deposited by streams carrying melt water from the ice sheet or was produced by re-working of till and other deposits along the shore of glacial Lake Iroquois (predecessor of the present Lake Ontario). The glacial till directly overlies the bedrock in most places. The lake-laid clay, silt, and sand overlie the till and are the materials found at the surface throughout a large part of the area. Sand and gravel occurs as isolated deposits and also composes a narrow "beach ridge" that extends in an east-west direction across the area (fig. 2 and pl. 3).

The bedrock in the Niagara Falls area consists of nearly flat-lying (horizontal) sedimentary rocks. The distinguishing feature of sedimentary rocks is their natural layering. Each layer is termed a bed and is separated from the bed above and below by a plane of separation called a bedding plane. The occurrence of sedimentary rocks in the Niagara Falls area can be described as "layer-cake geology" inasmuch as the various rock units crop out in "layer-cake" fashion at the brink of Niagara Falls as shown in figure 5. These units consist of dolomite, shale, limestone, and sandstone. Although the bedrock appears to lie horizontal to the eye, the beds actually dip to the south at about 30 feet per mile. The outcrop pattern produced by erosion of this simple geological structure is shown in plate 3. It can be seen that the area south of the Niagara escarpment is directly underlain by the Lockport Dolomite whereas the area north of the escarpment is underlain by the Queenston Shale. The intervening rocks of the Clinton and Albion Groups (fig. 5) crop out only along the escarpment and in the gorge of the Niagara River.



GEOLOGIC MAP OF NEW YORK

1970

Niagara Sheet

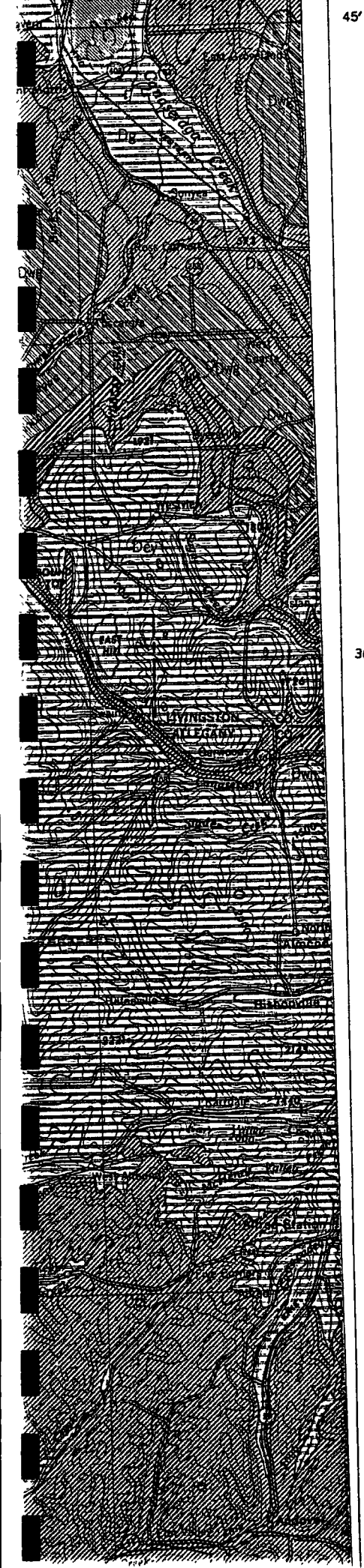
Scale 1:250,000

5 0 5 10 15 Statute Miles 20

5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

OFR-25



Middle Devonian

Dhmr

Dhsk Skaneateles Formation—Levanna Shale, Stafford Limestone Members.

Dhmr Marcellus Formation—Oatka Creek Shale Member.

ONONDAGA AND BOIS BLANC LIMESTONES
150 ft. (45 m.)

Lower Devonian

Dob Do

Dob In New York: Onondaga Limestone—Seneca, Morehouse (cherty), and Clarence Limestone Members, Edgecliff cherty Limestone Member, local coral bioherms; Bois Blanc Limestone—sandy, thin, discontinuous.
In Ontario: Dundee Limestone; Lucas Formation—dolostone, limestone (Anderdon); Amherstburg Formation—limestone, dolostone, sandstone (Sylvania); Bois Blanc Formation—dolostone, limestone, sandstone (Springvale).

Do Oriskany Sandstone.

AKRON DOLOSTONE AND SALINA GROUP
400-700 ft. (120-210 m.)

Upper Silurian

Sab Scv

Sab Akron Dolostone; Bertie Formation—dolostone, shale.

Scv Camillus, Syracuse, and Vernon Formations—shale, dolostone, salt, and gypsum.

LOCKPORT GROUP
150-200 ft. (45-60 m.)

Sl

Sl Guelph, Oak Orchard, Eramosa, and Goat Island Dolostones; Gasport Limestone—local bioherms.

CLINTON GROUP
100-150 ft. (30-45 m.)

Lower Silurian

Scl Sr Sik

Scl Decew Dolostone; Rochester Shale; Irondequoit and Merriton Limestones.

Sr Decew Dolostone; Rochester Shale.

Sik Irondequoit Limestone; Rockway Dolostone; Hickory Corners Limestone; Neahga Shale; Kodak Sandstone.

MEDINA GROUP AND QUEENSTON FORMATION
800 ft. (250 m.)

Upper Ordovician

Sm Oq

Sm Thorold Sandstone; Grimsby Formation—sandstone, shale; Power Glen and Cabot Head Shales; Whirlpool Sandstone.

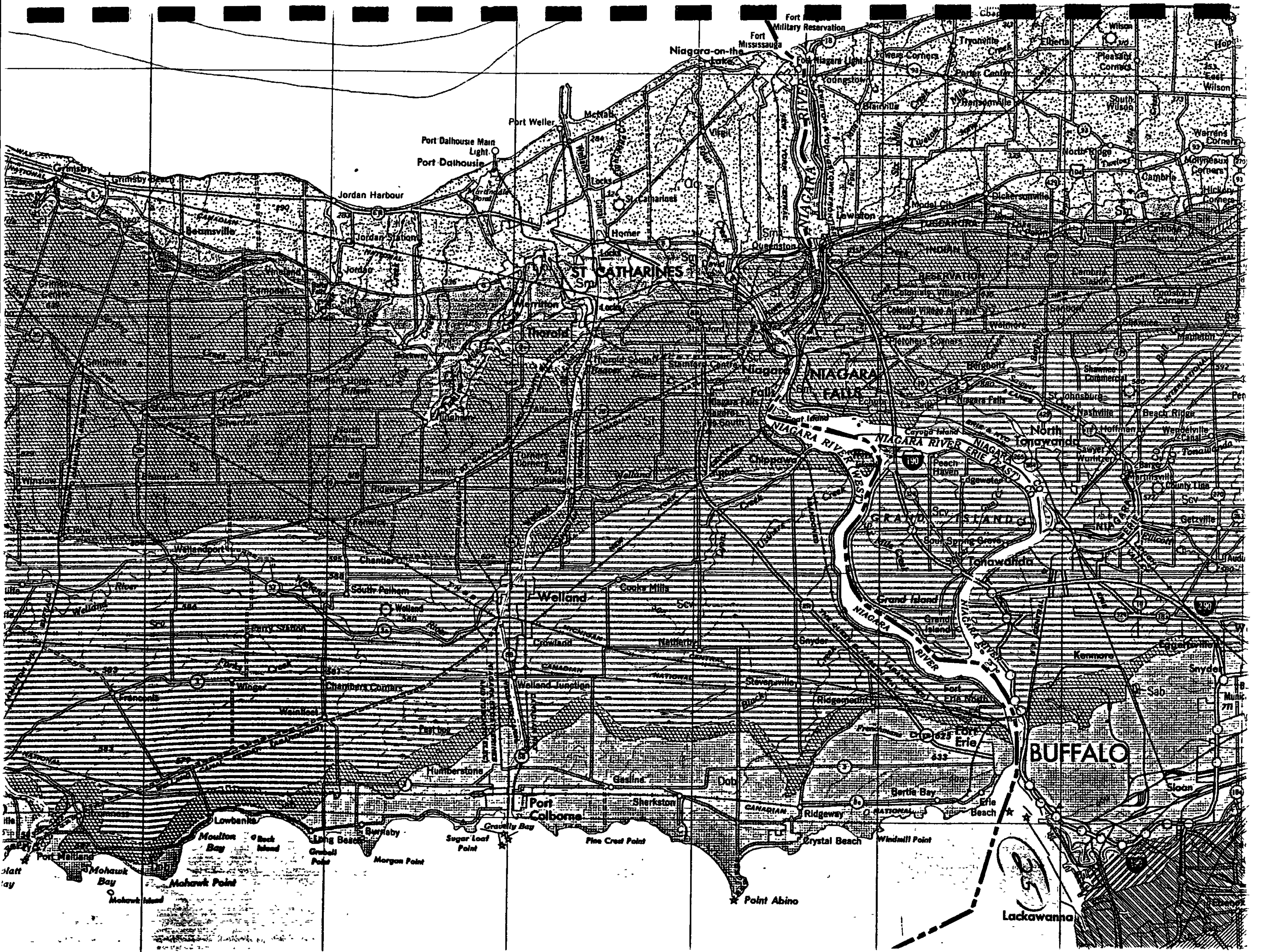
Oq Queenston Shale.

MAP SYMBOLS

Observed or approximately located contact

Conjectural contact; includes projections beneath extensive Quaternary cover and many contacts based on reconnaissance mapping.

Hypothetical contact; projection across unmapped area.



Fort Niagara Military Reservation
Fort Mississauga
Niagara-on-the-Lake
Youngstown
Lewiston
Port Weller
Port Dalhousie Main Light
Port Dalhousie
Jordan Harbour
Grimsby
Grimsby Beach
Beamsville
Jordan Station
Jordan
Vineland
St. Catharines
Homer
Queenston
Thorold
Merritton
Niagara Falls
NIAGARA FALLS
NIAGARA RIVER
Chippawa
Welland
Cooks Mills
South Pelham
Wellandport
Crowland
Welland Junction
Humberstone
Port Colborne
Sherkston
Ridgeway
Crystal Beach
Point Abino
Fort Erie
BUFFALO
Lackawanna
Grand Island
Tonawanda
North Tonawanda
Kenmore
Sloan
Snyder
Wilson
Cambria
Lowbanks
Moulton Bay
Mohawk Point
Mohawk Bay
Port Maitland
Long Beach
Morgan Point
Sugar Loaf Point
Gravelly Bay
Pine Crest Point
Windmill Point
Bertie Bay
Erie Beach
TUSCARORA INDIAN RESERVATION

APPENDIX B

PROPOSED UPDATED NYS REGISTRY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE
INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

CLASSIFICATION CODE: 2A **REGION:** 9 **SITE CODE:**

NAME OF SITE : TAM Ceramics
STREET ADDRESS: 4511 Hyde Park Blvd.
TOWN/CITY: Town of Niagara **COUNTY:** Niagara **ZIP:**

SITE TYPE: Open Dump- Structure- Lagoon- Landfill- X Treatment Pond
ESTIMATED SIZE: 15 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: TAM Ceramics
CURRENT OWNER ADDRESS.: 4511 Hyde Park Blvd., Niagara Falls, NY
OWNER(S) DURING USE...:
OPERATOR DURING USE...:
OPERATOR ADDRESS.....:
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1930 To 1976

SITE DESCRIPTION:

TAM Ceramics used the 15-acre field behind the process buildings for landfilling obsolete equipment, ceramic materials, metallic salts, sands, and waste oil.

In 1981, TAM removed all above ground wastes, however, all buried materials remain in the ground. Except for a waste oil pit, the exact location of the buried material is not known.

Several monitoring wells have been installed at this site as part of the adjacent Hyde Park Landfill Study. The major concern posed by the TAM Ceramic site is the potential cross-contamination of the groundwater with the Hyde Park Landfill.

HAZARDOUS WASTE DISPOSED: Confirmed- XX Suspected -

TYPE	QUANTITY (units)
Iron carbon titanium alloy	500 tons
Titanium oxide	386 tons
Ammonium zirconia carbonate solution	3.6 tons
Magnesium chloride with zirconium impurity	43 tons
Zirconium sodium potassium chloride	3.3 tons
Aluminum oxide	2,000 tons
Motor oil with silica fume	50 tons

SITE CODE:

ANALYTICAL DATA AVAILABLE:

Air- Surface Water- Groundwater- Soil-X Sediment- None-

CONTRAVENTION OF STANDARDS:

Groundwater-X Drinking Water- Surface Water- Air-

LEGAL ACTION: Occidental Chem.

TYPE..: State- Federal-
STATUS: In Progress- Completed-

REMEDIAL ACTION:

Proposed- XUnder Design- In Progress- Completed-
NATURE OF ACTION: Capping, overburden and bedrock collection systems.

GEOTECHNICAL INFORMATION:
SOIL TYPE: Interbedded silty clay, clayey silt, monor sand and gravel
GROUNDWATER DEPTH: 15-20 feet

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

The site is contaminated by chemicals that have migrated from the Hyde Park landfill in the overburden and the bedrock. Contamination resulting from wastes disposed at the TAM Ceramic site is unconfirmed.

ASSESSMENT OF HEALTH PROBLEMS:

Insufficient data to evaluate health problems posed by this site.

PERSON(S) COMPLETING THIS FORM:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION	NEW YORK STATE DEPARTMENT OF HEALTH
NAME.:	NAME.: R. Tramontano
TITLE: Asst. Chemical Engineer	TITLE: Bur. Tox. Subst. Assess.
NAME.: Peter Buechi	NAME.:
TITLE: Assoc. Sanitary Engineer	TITLE:
DATE.: Nov. 22, 1983	DATE.: 12/83